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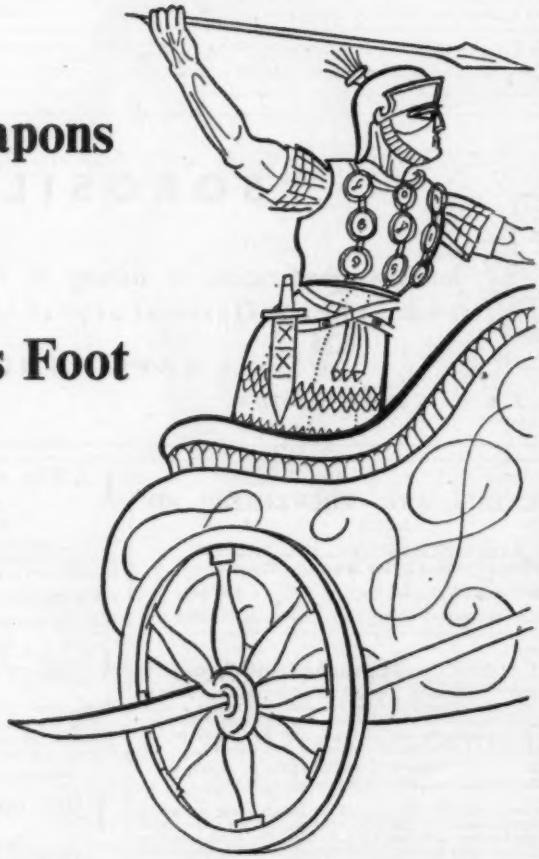

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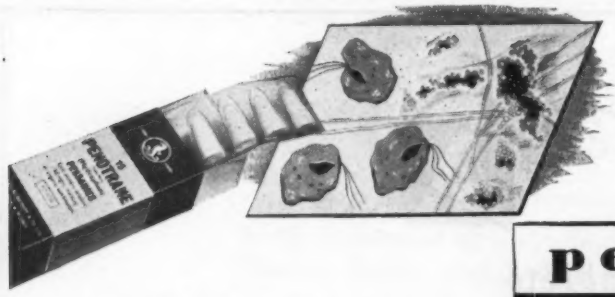

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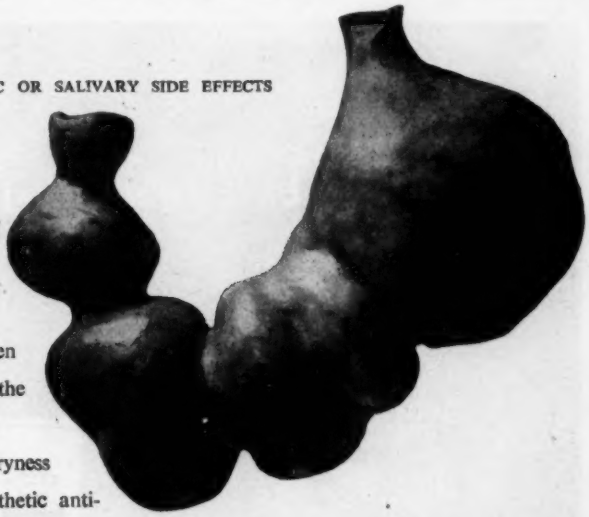

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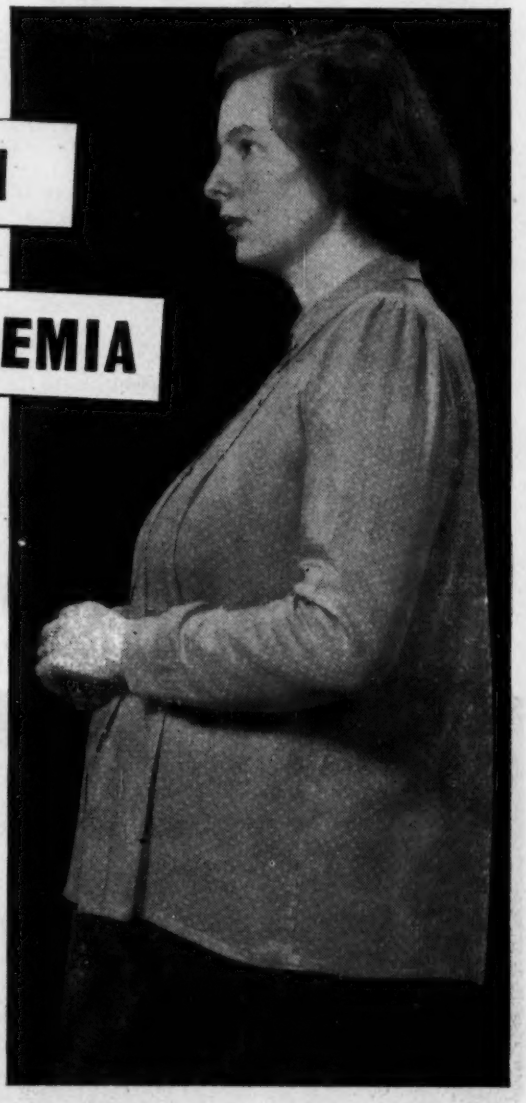

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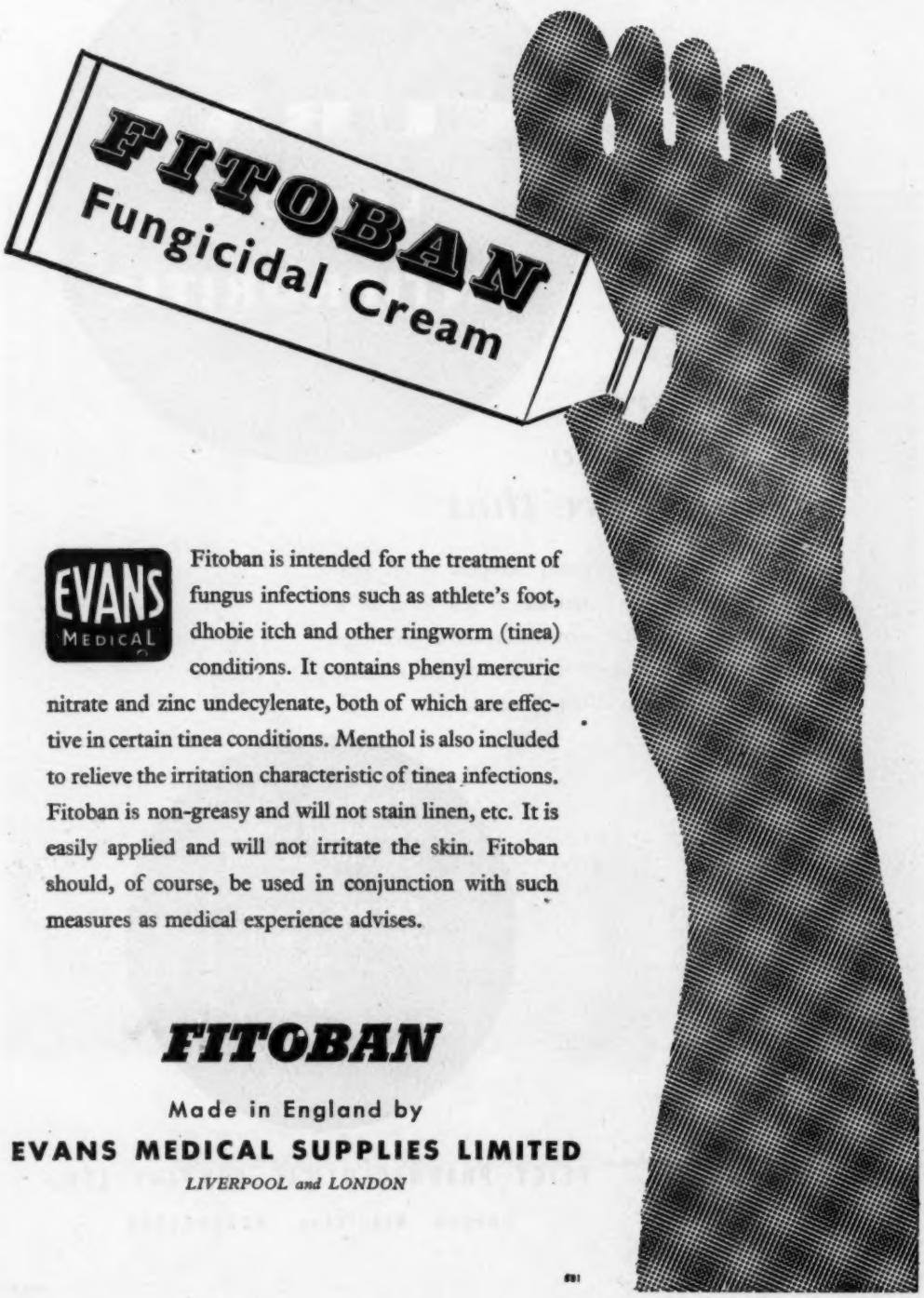

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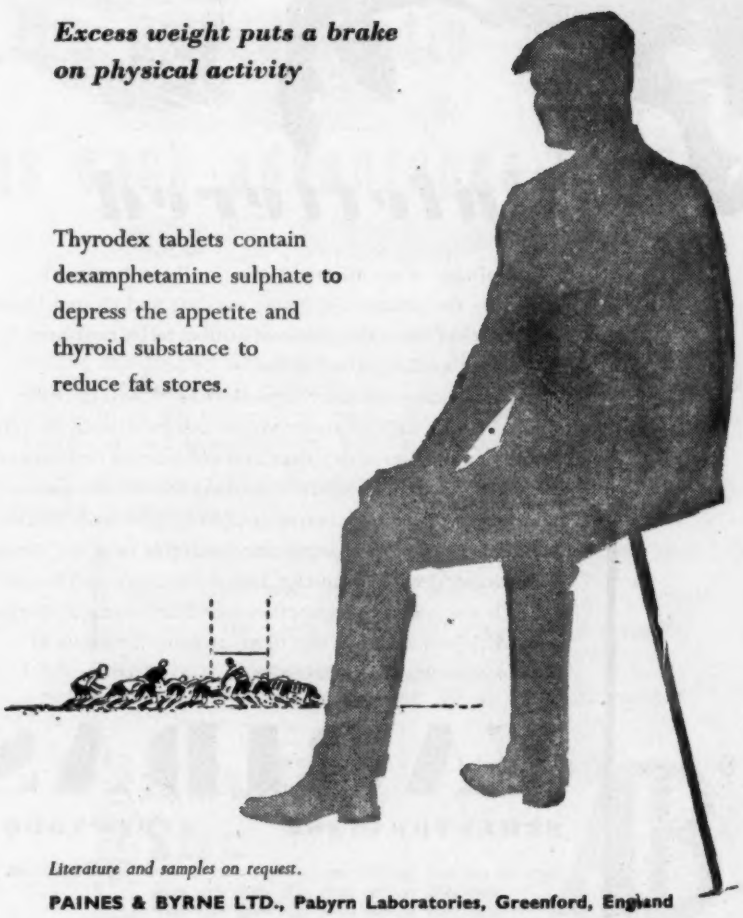

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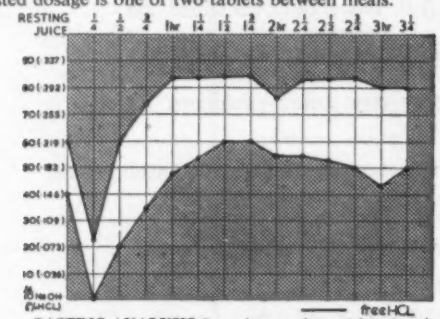

GASTRIC ANALYSIS Superimposed gruel fractional test-meal curves of five cases of duodenal ulcer

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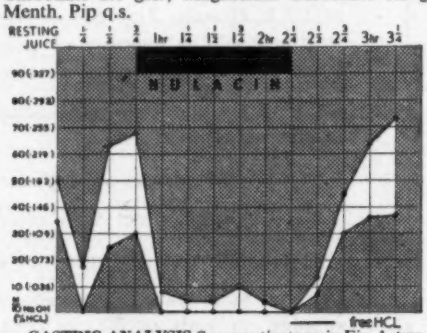

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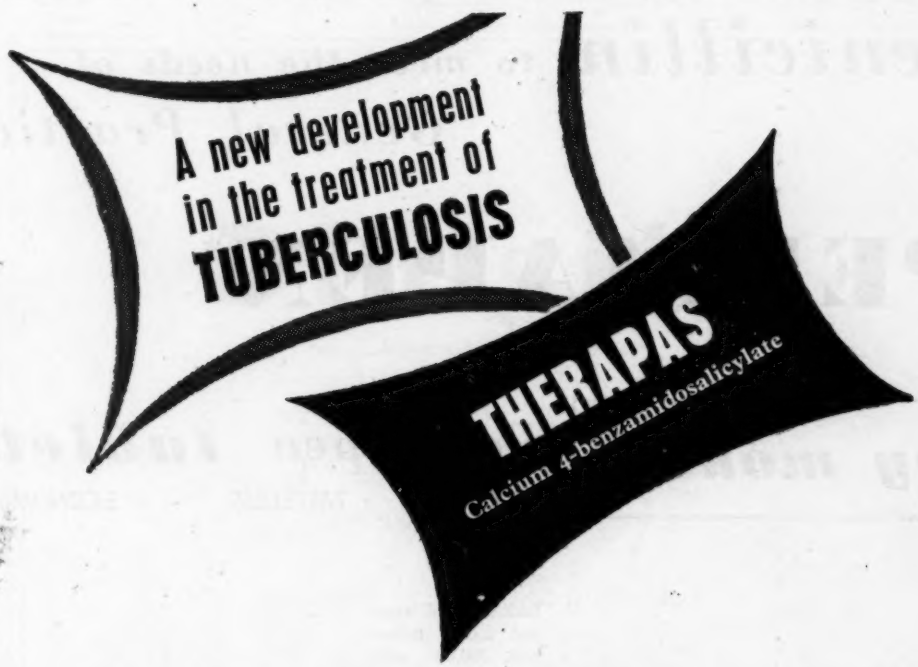

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(1) *J. Pharmacy & Pharmacol.*, 1953, **5**, 849.

(2) *Schweiz. Med. Wschr.*, 1955, **85**, 222.

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(6) *Tubercle*, 1955, **36**, 209.

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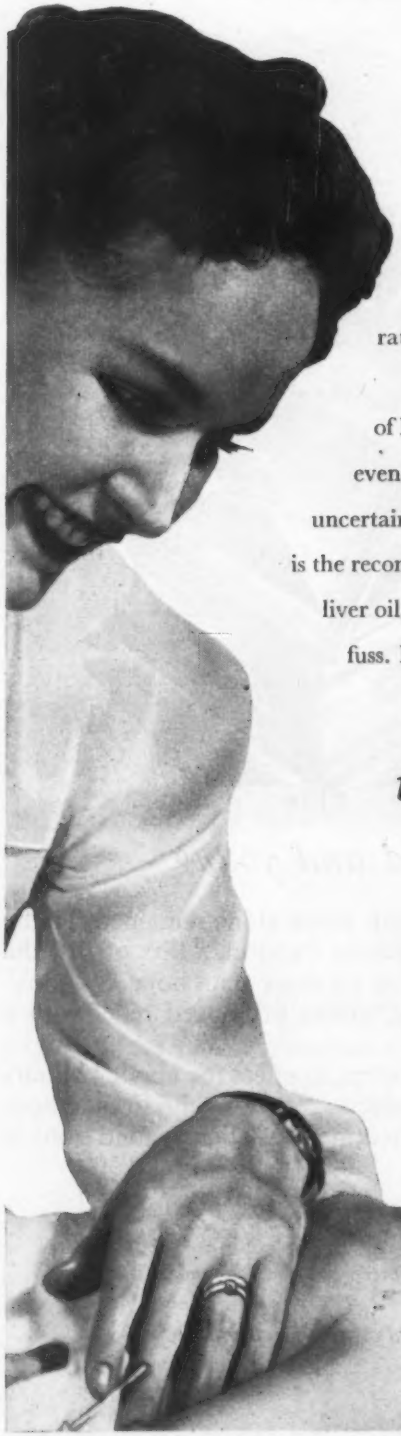

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KWASHIORKOR AND PROTEIN MALNUTRITION

A DIETARY THERAPEUTIC TRIAL *

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WE report here some preliminary results of a test of differing therapeutic diets in kwashiorkor.

Kwashiorkor is defined by the F.A.O./W.H.O. Expert Committee on Nutrition (1953) as due to protein malnutrition—i.e., to relative deficiency of protein foodstuffs in the diet. A protein foodstuff known to initiate cure without any other treatment is skimmed milk. The purpose of the trials described below was to define, if possible, the precise factors in skimmed milk which are responsible for initiating the cure of this syndrome.

Skimmed milk contains at least two important proteins, casein and lactalbumin. In addition, it contains carbohydrate, traces of fat, vitamins, minerals, and trace mineral elements. Almost certainly there must also be accessory food factors only partially identified—e.g., factor 3 (Schwarz 1952) and the *Lactobacillus bifidus* factor (György 1953).

Plan of Trial

A coöperative project was set up in South Africa in three centres—Cape Town, Pretoria, and Durban—to test the therapeutic efficiency of certain formulæ representing synthetic and partly synthetic substitutes for dried skimmed milk. A concurrent series of cases treated with dried skimmed milk was used as a control group. In the substitute formulæ there was successive elimination of the various nutrients known to be present in skimmed milk. The elimination started with lactalbumin and fat, proceeded to the known vitamins, and will end with the substitution of synthetic amino-acids for the casein. The effect of this latter substitution would be to eliminate unknown accessory food factors associated with casein. A salt mixture patterned on that of dried skimmed milk was kept constant throughout the synthetic and partly synthetic formulæ.

The following agreed standard procedures for preparing the feeding formulæ, for supplementary treatment, and for biochemical methods were adopted in each centre:

Feeding

For the first twelve to twenty-four hours all the patients were given by mouth, or if necessary parenterally, an electrolyte solution (Darrow's or Hartman's) with glucose. This period served for observation and for correction of dehydration and electrolyte imbalance if present. The test formula was then offered in a strength of 5–10 calories per fluid oz. (30 ml.) and, if refused, was given by gavage. The fluid intake prescribed was $2^1/_2$ oz. per lb. body-weight per twenty-four hours. With improvement in appetite the strength of the formula was increased to 15 calories per fluid oz. and the total fluid intake adjusted to the infant's demand. By the end of the test period an intake of 40–60 oz. (1200–1800 ml.) or 600–900 calories per twenty-four hours was achieved by most children in the test. The constituents of the individual formulæ and the code numbers by which they were known are set out in table I. Apart from the formulæ prescribed, no other food supplements of any sort were given during the test.

Chemotherapy

Procaine penicillin 300,000 units daily by intramuscular injection and oral sulphadiazine gr. $1^1/_2$ per lb. body-weight daily were administered for at least a week in each case from the start.

Weights

All the patients were weighed daily to measure their loss of œdema and their progress.

Blood Specimens

Blood was taken by venepuncture two or three times a week for estimation of serum-proteins and electrolytes, and for blood-counts, &c. Serum-proteins were estimated by the biuret method (Weichselbaum 1946). In Pretoria 27·2% sodium sulphate was used for the precipitation of the globulins, whereas in Durban and Cape Town 23% sodium sulphate was used. The results for Pretoria are therefore shown separately in fig. 1.

Definition and Selection of Cases

One of us (Brock 1955) has described in some detail the symptoms and signs which, when they are encountered

TABLE I—COMPOSITION AND CODE NUMBERS OF TEST FORMULÆ

S.A.D.M., South African dried skimmed milk (roller dried) with no vitamin supplement.

S.A.D.M.+V.S., South African dried skimmed milk with separate daily vitamin supplement of:

Thiamine	4–6 mg.	Vitamin B_{12}	6 µg.
Nicotinic acid	30–35 mg.	Vitamin A	6000 units
Riboflavine	3·4–4·4 mg.	Vitamin D	1600 units
Pyridoxine	4 µg.	Ascorbic acid	80–105 mg.
Calcium pantothenate	0·25–1 mg.	Folic acid	5 mg.

In Pretoria $1^1/_2$ minims of 85% lactic acid per fluid oz. was added to the skimmed milk mixtures.

C_2, labco vitamin free casein 38·0 g., salt mixture* 9·6 g., vitamins† 0·2 g., and glucose 52·2 g. per 100 g. of dry formula.

*NaCl	1·525 g.	†Thiamine	1·0 mg.
K_2HPO_4	3·00 g.	Riboflavine	2·0 mg.
$CaHPO_4.2H_2O$	2·7 g.	Pyridoxine	1·0 mg.
$CaCl_2$	0·32 g.	Calcium pantothenate	10 mg.
CaO	0·735 g.	Nicotinamide	10 mg.
$Mg.SO_4.7H_2O$	1·14 g.	Inositol	5·0 mg.
$Cu.SO_4.5H_2O$	0·0052 g.	Choline	100 mg.
Ferric citrate	0·11 g.	Para-aminobenzoic acid	30·0 mg.
KI	0·0032 g.	Biotin	0·2 mg.
$MnSO_4.4H_2O$	0·02 g.	Folic acid	0·2 mg.
$ZnCl_2$	0·001 g.	Vitamin E	14·2 mg.
		Menadione	14·2 g.
		Vitamin B_{12}	0·01 g.
Total	9·6062 g.	Total	207·66 mg. per 100 g. of formula

With this formula a daily extra supplement of vitamin A 1000–6000 units and vitamin D 1000–2000 units was given.

C_2, labco vitamin-free casein, 38·0 g., salt mixture 9·6 g., and glucose 52·4 g. per 100 g. of dry formula.

No vitamin supplement of any kind was given with this formula.

* In this coöperative project the organisation and the preliminary testing of all formulæ were undertaken by Prof. J. F. Brock and Dr. J. D. L. Hansen, respectively of the departments of medicine and pædiatrics of the University of Cape Town and Groote Schuur Hospital. Dr. E. E. Howe, of Merck & Co., Inc., Rahway, New Jersey, U.S.A., was in close consultation at all times and supervised the preparation of the formulæ, which were supplied by Marck & Co., Inc. After preliminary testing, including complete metabolism balance tests, had been carried out at Cape Town, the formulæ were submitted for further trial on the large numbers of cases available at Pretoria and Durban. At Pretoria the work was done by Dr. P. J. Pretorius in consultation with Prof. J. Davel, of the department of pædiatrics, University of Pretoria and Pretoria Hospital. At Durban the work was done by Dr. R. G. Hendrickse in consultation with Dr. F. Walt, of the pædiatric department of McCord Zulu Hospital, Durban.

against a background of probable protein malnutrition, should lead the clinician to suspect that he is dealing with kwashiorkor. Some laboratory criteria are given which can be used for confirmation, but the view is expressed that in the last resort diagnosis may depend on the successful result of appropriate feeding. The criteria described by Brock (1955) were used in selecting cases for the present trials.

All the cases selected as kwashiorkor showed (1) a dietary history suggesting protein malnutrition; (2) œdema associated with hypo-albuminæmia and not explained by renal, cardiac, or other disease; (3) retarded growth; (4) peevish mental apathy; and (5) a variable dermatosis. In the great majority of cases in Pretoria and Durban the characteristic dyspigmentation and alteration in the texture of the hair were observed. In Cape Town, where the cases are mostly among Cape Coloured (mulatto) people, dyspigmentation of the hair is much less easy to detect, but alteration in its texture is common. Under the conditions of this project it was not feasible to establish the presence, in every case, of fatty liver or reduced duodenal enzymes. All the cases coming to necropsy had fatty liver.

Owing to periodic shortage of test materials strict random sampling of cases was impossible. In allocating any case to any particular therapeutic test group, conscious bias was not exerted, and when test materials were in good supply the cases were selected at random. No cases were rejected unless the child was moribund or subsequently found to have progressive tuberculosis. The age-distribution is shown in table II.

Criteria of Response to Therapeutic Test

As stated above, skimmed milk initiates cure in a substantial proportion of cases of kwashiorkor.

This "initiation of cure" can be described in the following way. After the institution of dietary therapy with skimmed milk the general condition almost immediately improves. Within the first three to seven days the apathetic, irritable, and anorexic child changes into one that is beginning to take an interest in his surroundings, is no longer irritable, and clamours for feeds. His weight may remain stationary for a few days or increase through œdema. After this he has a diuresis which produces a steady loss of weight and disappearance of œdema by the seventh to fourteenth day. Although at this time he may look somewhat wasted owing to loss of œdema, his general appearance is vastly improved. Muscle tone and play activity have returned, the skin improves in texture, and scaling and ulcerative lesions heal. (The pigmentary changes are usually still present because they take much longer to disappear.) Serial estimations of the serum-albumin level show a rapid rise with recovery, and by the fourteenth day are often twice as high as on admission. In the third week the weight becomes stable, or there may already be a true gain in weight due to the formation of new tissue. At this stage cure has been initiated fully and the therapeutic tests end. At this point the introduction of mixed feeding is necessary to satisfy appetite, to promote growth and development, and to consolidate cure. The time required for initiation of cure is usually between twelve and twenty-one days. In some cases severe infections and diarrhœa delay the above sequence of events, and such cases are usually found in groups II and III in the results—i.e., requiring additional antibiotics, plasma, or blood. In the present series no patients were treated with test formulæ for more than twenty-four days

At the end of the therapeutic trial the children were put gradually on to mixed feeding and discharged with appropriate instructions to the parents.

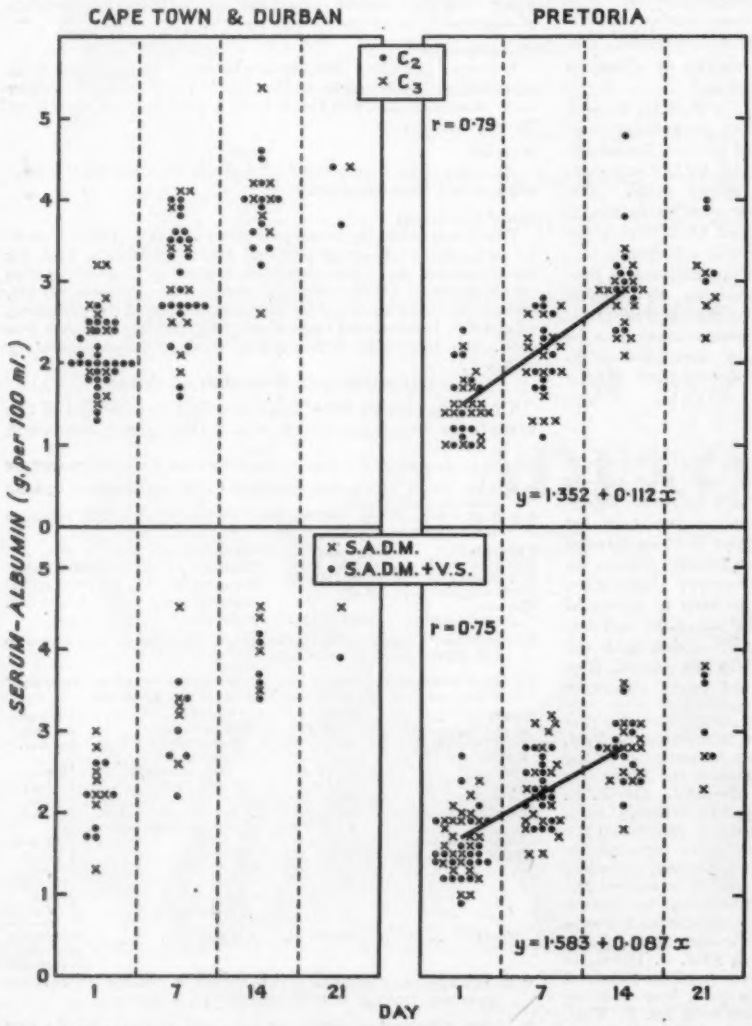

Fig. 1—Rise of serum-albumin during treatment with test formulæ: S.A.D.M., skimmed milk; S.A.D.M.+V.S., skimmed milk with vitamin supplement; C_2, casein formula with vitamins; C_3, casein formula without vitamins.

TABLE II—AGE-DISTRIBUTION OF 135 CASES

Centre	Age (yr.)				Youngest	Oldest
	0–1	1–2	2–3	Over 3		
Pretoria ..	4 (5%)	48 (62%)	19 (25%)	6 (8%)	8 mos.	55 mos.
Durban ..	8 (20%)	26 (65%)	6 (15%)	0	6 mos.	30 mos.
Cape Town	2 (11%)	14 (78%)	2 (11%)	0	11 mos.	24 mos.
Total ..	14 (10%)	88 (65%)	27 (20%)	6 (5%)		

Difficulties Encountered and Modifications of Standard Régime

Kwashiorkor, even with the best of nursing, medical care, and drugs, is associated with an over-all mortality-rate of 10–15% (Dean and Schwartz 1954). Criteria of severity are ill defined, and complicating infections are often present though difficult to detect. Diarrhœa is common even in the recovery phase and leads to electrolyte disturbance (Hansen and Brock 1954). Sometimes there is severe anæmia (Adams 1954). In the initial stages irritability and anorexia require expert and patient handling. As sudden deterioration within a few hours is common, continuous observation by trained personnel is necessary.

In view of these difficulties modification of the standard régime was sometimes required in the interest of the patient. These modifications took two main forms:

(1) *Additional antibiotic therapy* was given where complicating infections were severe and uncontrolled by penicillin and sulphadiazine. Chloramphenicol, chlortetracycline, and oxytetracycline were the drugs used.

(2) *Supportive treatment* in situations of collapse, dehydration, or severe anæmia took the form of parenteral electrolyte therapy and transfusions of blood or of plasma.

In addition, if a substitute test formula was not tolerated by the patient skimmed milk was given instead.

Results

In grouping the results as follows the above-mentioned variables have been taken into account:

Group I are cases in which no treatment was given other than that laid down as standard for all and in which cure was fully initiated within twenty-one days.

Group II are cases in which the same end-result was achieved only with the aid of additional antibiotic therapy as indicated above.

Group III are cases in which supportive transfusion of plasma or of blood was necessary to initiate cure. This group also includes the cases in which it was thought advisable in the patient's interest to change the formula—e.g., because of evidence of intolerance—and those in which the supervention of severe infection, diarrhœa, or anæmia so retarded the recovery that full initiation of cure was impossible in the time given to the test.

Group IV are the deaths (divided into those occurring within forty-eight hours of admission and those occurring later).

The results are set out, according to this grouping, in table III.† With each of the test formulæ initiation of cure by the diet, with only penicillin or sulphadiazine as supportive treatment (group I) was achieved in 40–60% of cases. In a proportion of cases equally good results could be obtained only with more vigorous antibiotic treatment (group II) and supportive transfusions (group III). The mortality-rate was lowest with the 'C_3' formula (10%) and highest with the 'S.A.D.M.' formula (30%); but if forty-eight-hour deaths are excluded, these figures become 10% and 18% respectively, suggesting that the differences may well be due to chance selection of more severe cases in the S.A.D.M. group. To overcome the variables of supportive treatment and to facilitate statistical analysis a simplified grouping has been adopted in table IV. Here group I has remained as before, but groups II, III, and IV have been classed together as failures. In this way it is possible to examine the ability of a formula to initiate cure in the absence of any supportive treatment other than penicillin and sulphadiazine.

TABLE IV—STATISTICAL COMPARISON OF EFFICACY OF TEST FORMULÆ (CAPE TOWN, PRETORIA, AND DURBAN COMBINED)

—	Group I (cure)	Groups II, III and IV (failure)	Total
S.A.D.M. + V.S. (skimmed milk with vitamin supplement)	17 (60·7%)	11 (39·3%)	28
S.A.D.M. (skimmed milk without vitamin supplement)	14 (42·4%)	19 (57·6%)	33
C_3 (casein with vitamins)	26 (59%)	18 (41%)	44
C_3 (casein without vitamins) ..	15 (50%)	15 (50%)	30
Total	72 (53%)	63 (47%)	135

Analysis by χ^2

S.A.D.M. + V.S./S.A.D.M. .. .. 0·2 > P > 0·1
C_3/C_3 .. .. 0·5 > P > 0·3
S.A.D.M. and S.A.D.M. + V.S./C_3 and C_3 .. .. 0·7 > P > 0·5
S.A.D.M. + V.S. and C_3/S.A.D.M. and C_3 .. .. 0·2 > P > 0·1

† Illustrative case-histories (multigraphed) may be had on application to the office of THE LANCET, 7, Adam Street, Adelphi, London, W.C.2.

TABLE III—DETAILED ANALYSIS OF RESULTS

Formula	Centre	No. of cases	Group I	Group II	Group III	Group IV	
						Total	48-hr. deaths excluded
S.A.D.M. + V.S. (skimmed milk with vitamin supplement)	Pretoria	21	14	1	3	3	2
	Durban	7	3	2	1	1	1
	Cape Town	0	0	0	0	0	0
	Total	28	17 (60·7%)	3 (10·7%)	4 (14·3%)	4 (14·3%)	3 (10·7%)
S.A.D.M. (skimmed milk without vitamin supplement)	Pretoria	24	13	0	5	6	4
	Durban	8	0	2	2	4	2
	Cape Town	1	1	0	0	0	0
	Total	33	14 (42%)	2 (6%)	7 (22%)	10 (30%)	6 (18%)
C_3 (casein formula with vitamins)	Pretoria	14	12	1	0	1	1
	Durban	20	9	0	5	6	5
	Cape Town	10	5	1	1	3	2
	Total	44	26 (59%)	2 (4·5%)	6 (13·5%)	10 (23%)	8 (18%)
C_3 (casein formula without vitamins)	Pretoria	18	11	1	5	1	1
	Durban	5	1	0	4	0	0
	Cape Town	7	3	0	2	2	2
	Total	30	15 (50%)	1 (3%)	11 (37%)	3 (10%)	3 (10%)

TABLE V—STATISTICAL ANALYSIS OF RESULTS FROM PRETORIA

—	Group I (cure)	Groups II, III, and IV (failure)	Total
S.A.D.M. + V.S. (skimmed milk with vitamin supplement)	14 (66%)	7 (34%)	21
S.A.D.M. (skimmed milk without vitamin supplement)	13 (54%)	11 (46%)	24
C_2 (casein with vitamins)	12 (85%)	2 (15%)	14
C_3 (casein without vitamins) ..	11 (61%)	7 (39%)	18
Total	50 (65%)	27 (35%)	77

Analysis by χ^2

S.A.D.M., V.S./S.A.D.M. .. .. $0{\cdot}5 > P > 0{\cdot}3$
S.A.D.M., V.S. + S.A.D.M./C_2 + C_3 .. .. .. $0{\cdot}3 > P > 0{\cdot}2$
S.A.D.M. + V.S./C_2 .. .. $0{\cdot}8 > P > 0{\cdot}7$

On this basis the differences in cure-rate achieved by the various formulæ have been tested by χ^2 and found to be not significant (see table IV for probability values). Likewise, if all the cases treated with skimmed milk as a basic formula are compared with all the cases treated with casein as a basic formula, there is no significant difference in cure-rate. The same may be said for all the formulæ containing added vitamins, compared with those containing no added vitamins.

To minimise the effect on the results of differences in case-material and ward handling between the three centres, the biggest series of cases (that from Pretoria) has been separately analysed in table v. Here again no significant differences are found in the cure-rates with the various test formulæ.

The rise of serum-albumin level achieved with each formula series may be seen in fig. 1. It bears a strictly linear relationship to the duration of treatment throughout the first fourteen days. The regression coefficients did not differ between Cape Town, Durban, and Pretoria. The recovery of serum-albumin level, measured by the regression slope was in no way different for the casein formulæ and for the dried milk formulæ.

The addition of a vitamin supplement to dried milk (S.A.D.M.+V.S.) did not accelerate the return of the serum-albumin level to "normal," judged by the fact that there was no significant alteration in the steepness of the slope obtained from the use of dried milk without a vitamin supplement (S.A.D.M.).

The lack of effects of vitamins on restoration of the serum-albumin level is further shown in fig. 2, where the regression slope of cases with the "vitamin-free" casein formula C_3 proved to be as steep as that obtained when known vitamins were added to the casein formula (C_2).

Discussion

As stated above, the primary purpose of the studies here reported and those still in progress is to determine which of the nutritive factors in skimmed milk initiate the cure of kwashiorkor. This knowledge would help to elucidate the pathogenesis of this serious illness and thus lead to more efficient treatment and prevention. It would also greatly aid in the selection of suitable plant proteins to take the place of animal proteins in areas where these are scarce.

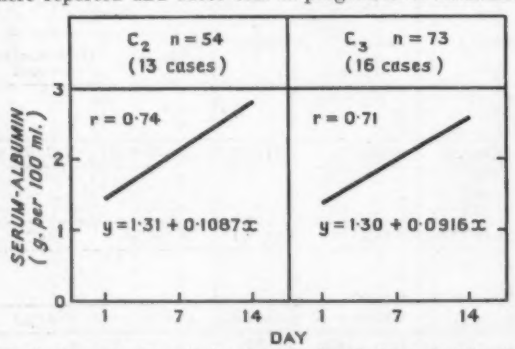

Fig. 2—Regression lines of rise of serum-albumin (y) against time (x) during treatment with casein formula C_2 (with vitamins) and casein formula C_3 (vitamin-free) in results obtained in Pretoria. (In fig. 1 only those estimations are plotted which happened to fall on the 1st, 7th, 14th, and 21st days.)

Our results concern only "initiation of cure" which has been carefully defined, and no conclusion can be drawn about "consolidation of cure." It seems reasonable, however, to assume that nutrients reversing the downward course of kwashiorkor and initiating cure must also be among those necessary for consolidation of cure. They are also probably the main limiting nutrients in the diets that give rise to kwashiorkor.

The data to hand indicate that all the four formulæ tested can initiate cure, and that all four therefore contain the nutrients required for initiation of cure. The finding that a partly synthetic formula (C_3) consisting of 'Labco vitamin-free casein,' dextrose, and a salt mixture has proved no less effective than skimmed milk is important. On this minimal formula even the skin and mucous-membrane lesions, usually attributed to associated vitamin deficiencies, have healed completely. Biochemical criteria of successful response to treatment—e.g., a rise in serum-albumin, and, in a few cases, of serum-amylase—have also been fulfilled with this formula.

With a larger series of cases the differences in rates of cure and of failure may prove significant. The project is being pursued to bring a greater number into each series, so that the relative efficiency of the individual formulæ can be better assessed.

It should be noted that the standard adopted for successful initiation of cure (group I) has been very strict. For the purpose of statistical analysis, cases falling into groups II and III—i.e., those requiring subsidiary antibiotic or supportive therapy—have been classified as failures. Many of these cases, however, had responded in whole or in part to the dietary therapy; and, if these are added to group I, the proportion of cases responding to each formula becomes very substantial.

The differences in results between the three centres and the variability in rates of cure and of death (both before and after forty-eight hours) emphasise certain complexities involved in a nutritional trial concerning kwashiorkor. When a case of kwashiorkor is brought to hospital, the disease is already in an advanced stage and requires urgent treatment. The serum chemistry (Hansen and Brock 1954, Dean and Schwartz 1953, Trowell et al. 1954) reveals a gross disturbance of protein, enzyme, electrolyte, and water metabolism that must affect every organ and tissue. Clinical assessment of severity and prognosis are usually extremely difficult. No single sign or group of physical signs can be said to aid in this respect. Often patients who appear to be in extremis, with gross skin and other lesions, respond rapidly to treatment, whereas others judged to be only moderately ill may die unexpectedly.

Regional characteristics superimposed on the basic syndrome are also important. The differences we are mainly concerned with resolve themselves into the following:

(1) *Basic diet before admission* consists chiefly of maize (corn) porridge in Pretoria and Durban, whereas in Cape Town vegetables, such as squash (*Cucurbita Pepo* L. var.), carrots, and potatoes are added to small amounts of cereal. The calorie intake in the Cape Town cases is probably less than in the Pretoria and Durban cases. Hence the Cape Town cases merge more towards the undernourished or marasmic end of the kwashiorkor spectrum than do the cases in the other centres, some of which are towards the fatter or "sugar-baby" end. At all three centres protein intake is inadequate.

(2) *Race.*—Most cases in Durban and Pretoria are in children of Bantu stock, whereas those in Cape Town are in children of mixed origin known as the Cape Coloured. The life and

TABLE VI—PRELIMINARY RESULTS OBTAINED WITH BORDEN'S SKIMMED LACTIC ACID MILK

Centre	No. of cases	Group I	Group II	Group III	Deaths
Pretoria ..	4	4	0	0	0
Durban	4	3	1	0	0
Cape Town ..	3	2	1	0	0
Total ..	11	9 (82%)	2 (18%)	0	0

feeding habits of the latter are patterned rather on the poor European than on the Bantu (Brock 1949).

(3) *Anæmia.*—Many cases in Durban were complicated by considerable anæmia, often megaloblastic, which was not seen in the other two centres. This anæmia was severe enough to warrant additional therapy in the form of blood-transfusion and folic acid, and accounts for the lower proportion of cases at that centre falling into group I.

In other respects the cases were clinically very similar, and there is no doubt that they were the same syndrome. Diarrhœa was common in all three centres, in contrast to findings in Uganda (R. F. A. Dean, personal communication). This complication necessarily increases the severity of the syndrome and contributes significantly to the morbidity and mortality rates. The total mortality of this series is 27 out of 135 cases (20%). For the three centres separate mortality figures are:

Cape Town	5 cases (27·6%)
Pretoria	11 cases (14·3%)
Durban	11 cases (27·5%)

The figures are high compared with some recent reports from other centres. Thus in Coonoor (Nutrition Research Laboratories 1954) the mortality in 34 cases treated with skimmed milk alone was 6%, and for 35 cases treated with vegetable protein 3%. In another communication from the same centre Venkatachalam et al. (1954) report a mortality of 9·3% (including forty-eight-hour deaths) in 207 cases treated with skimmed milk.

Dean and Schwartz (1954) point out that mortality-rates cannot be accurately compared, because criteria of diagnosis and severity differ from place to place. At one centre children may be brought only when moribund, whereas at another the progressive signs may be well recognised, and the children seen and treated, before the disease is far advanced. At our three centres cases are initially seen at busy and overcrowded outpatient departments of general hospitals. For every child admitted many have to be sent home; and among those coming into hospital a high proportion are severely ill. An important factor in treatment and mortality is age. Susceptibility to infection and disorders of water and electrolyte balance is greater in the youngest. As can be seen from table II, the vast majority of children in this trial were under the age of 2.

To obviate the possibility that regional differences may affect the interpretation of results, a separate analysis was made of the largest series—that from Pretoria. It has shown a trend indistinguishable from that of the whole group (table IV).

It must be allowed that the inclusion of sulphonamide (by mouth) and penicillin (by injection) in the basic treatment introduces some uncertainty in that these preparations may have altered the bacterial flora of the intestines. This treatment, however, was necessary in the interest of the infants. The dosage was uniform in all the groups; and, as there is no evidence that kwashiorkor can be cured by any form of antibiotic or drug therapy without appropriate diet, we feel that the interpretation of the results has not been vitiated by this treatment.

Gastro-intestinal intolerance of experimental diets is an important problem. A formula that aggravates diarrhœa will retard recovery even if it contains all the essential nutrients. The method of processing of the dried-milk formula may also be a factor. The skimmed milk used in our studies was a South African product processed by roller drying. An imported proprietary brand of dried skimmed lactic-acid-treated milk prepared by the spray process is being tested for comparison with the results achieved with S.A.D.M. The preliminary results in 11 cases are extremely favourable (table VI). If true differences are confirmed by further study they can reasonably be attributed to the method of processing, including the lactic-acid treatment.

Although this form of testing has limitations certain implications arise out of the data. The lesions of skin and mucous membrane have long been put down to a concurrent vitamin deficiency, though no one vitamin or group of vitamins has been definitely incriminated. In our series the vitamin-supplemented group showed a somewhat higher cure-rate, but the difference was not statistically significant; and this is in keeping with the experience of Altmann (1948) and Gomez et al. (1954) that vitamin supplements to a basic milk formula are of no particular advantage in the treatment of kwashiorkor. An adequate explanation would be that milk has an appreciable vitamin content (Clements 1949). Our findings that a "vitamin-free" casein mixture (C_3) initiated cure in 50% of cases (in Pretoria 61%) are thus of great interest and importance. They suggest that the known vitamins are not of themselves the major limiting nutrient factors in the pathogenesis of kwashiorkor, although it is obvious that specific vitamin deficiencies may coexist. It must be re-emphasised that the present tests were limited to the initiation of cure and did not last longer than three weeks. No doubt, if the vitamin-free formula had been continued beyond this period, adverse effects would have become manifest. Obviously, to consolidate cure all essential nutrients will be required.

No statistical difference could be found in the speed or degree of restoration of the serum-albumin level with the four different formulæ. This objective measurement lends strong support to the clinical findings.

Neither of the two casein formulæ used (C_3 and C_4) contained lactalbumin, globulin, or fat, and it is apparent from the statistical comparisons in table IV that these two fractions of skimmed milk do not contribute significantly to the initiation of cure. The same may be said of milk carbohydrate, which as a source of calories has no demonstrable advantage.

We are thus drawn to the tentative conclusion that the curative factors in skimmed milk lie within the casein, mineral, and trace-element fractions. Casein contains the essential and some non-essential amino-acids (Clements 1949), partially identified factors such as Schwarz's factor 3 (Schwarz 1952), and perhaps others not yet identified. It is proposed to continue the studies along the same lines with a casein formula from which Schwarz's factor 3 has been removed, and with formulæ in which synthetic amino-acids take the place of casein. The amino-acid formulæ will contain the same salt mixture and will be tested first with, and later without, vitamins. From these trials it should be possible to assess better the individual rôles played by essential amino-acids and accessory factors in initiating the cure of kwashiorkor.

Summary

Therapeutic trials in cases of kwashiorkor at three centres in South Africa are described, the object being to determine which nutrients in skimmed milk are responsible for curing this disease.

The trials were limited to the initiation of cure, no conclusions being drawn about its consolidation.

In kwashiorkor cure can be initiated by giving skimmed milk without further dietary supplements.

A partly synthetic formula, C_3, consisting of Labco "vitamin-free" casein, water, glucose, and a salt mix-

ture, proved to be no less effective than skimmed milk both in initiation of cure and in restoring the serum-albumin level. Evidently, therefore, this formula contains the curative factors of skimmed milk.

The tests are being continued with Labco casein from which Schwarz' factor 3 has been removed, and with mixtures of pure amino-acids patterned on casein.

Addendum

Since this paper was completed 9 cases have been treated by identical methods with an amino-acid formula (A.2.) of the following composition :

L—Arginine HCl	19·5 g.	DL—Valine	53·0 g.
L—Histidine HCl-H_2O	13·0 g.	DL—Aspartic acid	61·0 g.
DL—Isoleucine	57·0 g.	L—Glutamic acid	82·0 g.
L—Leucine	42·0 g.	Glycine	8·8 g.
L—Lysine HCl	41·5 g.	DL—Alanine	30·0 g.
DL—Methionine	12·0 g.	DL—Serine	33·0 g.
DL—Phenylalanine	30·0 g.	L—Tyrosine	23·0 g.
DL—Threonine	36·0 g.	L—Cystine	3·8 g.
DL—Tryptophane	11·4 g.	L—Proline	38·0 g.

To this mixture of 595 g. of amino-acids are added glucose 307 g., salt mixture 96·06 g., and vitamins 2·00 g.

The results are :

Centre	No. of cases	Group I	Group II	Group III	Group IV
Pretoria	4	2	0	2	0
Cape Town	5	3	1	0	1
Total	9	5 (*56%*)	1 (*11%*)	2 (*22%*)	1 (*11%*)

The recovery-rate in this small series is therefore comparable to that obtained with the milk and casein formulæ.

It can be concluded at this stage that, in at least some cases of kwashiorkor, cure can be initiated with mixtures of synthetic amino-acids supplemented by known vitamins. In these cases at least, no unidentified dietary factors, such as Schwarz's factor 3 and György's *Lactobacillus bifidus* factor, are required for the initiation of cure as defined.

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COMPLETE RELIEF OF GOUT

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CONTINUOUS administration of sodium salicylate controls the serum uric-acid level in gouty people and usually leads to cessation of the symptoms of chronic gout, with arrest and partial repair of destructive changes (Marson 1953) which may be demonstrable radiologically (Marson 1952). Continuous administration of probenecid has likewise been used in the treatment of chronic gout (Gutman 1950, Gutman and Yü 1951, 1955, Talbott 1953, Marson 1954) and is indicated in patients who cannot easily tolerate sodium salicylate in sufficient dosage. Unfortunately probenecid lowers the serum uric-acid levels and increases the urinary excretion of uric acid much less than does sodium salicylate (Marson 1954). In some patients probenecid precipitates acute gouty attacks during the first few weeks' treatment ; initial toxic symptoms are common, and severe allergic reactions may develop (Marson 1954). Probenecid is also much more expensive than sodium salicylate.

Though it is generally accepted that chronic gouty arthritis results from deposition of uric acid in the tissues, little is known about the rôle of uric acid in the ætiology of recurring acute attacks. In most patients maintenance of the serum uric-acid level at normal or near normal values does not immediately protect the patient from further attacks (Marson 1953) ; and this fact has led to the suggestion that uric acid per se is not responsible for the acute paroxysms (Mason 1954). Nevertheless it has been reported that the acute episodes decrease in frequency and severity during long-continued administration of salicylate (Marson 1953).

After five years' experience with the continuous drug treatment of gout I am convinced that acute gout ceases to occur when the serum uric-acid level is controlled ; but this control is not usually achieved until treatment has been continued for several months.

The purpose of this communication is to demonstrate how effective the control of gout can now be.

Clinical Material

The seven cases described here are taken from a much larger series under both treatment and observation. The only criteria for selection are that all the patients presented with chronic gouty arthritis, the blood-urea level was normal in each case, and the patients had been studied for more than 18 months.

Investigations made before treatment included an estimation of the blood-urea level and repeated estimations of the serum uric-acid level by the method of Brown (1945). The patients have been seen each month at a gout clinic, where their progress has been recorded, the serum uric-acid level estimated, and appropriate drugs prescribed. No dietary or alcoholic restrictions have been imposed and, apart from a large intake of fluids, and the administration of colchicine for the acute episodes (0·5 mg. 2-hourly until pain disappears or toxic symptoms appear), treatment has been restricted to the continuous administration of either sodium salicylate or probenecid. Sodium salicylate has been prescribed in an initial dosage of gr. 30 thrice daily, and usually dispensed in a fluid mixture containing a flavouring agent and sodium sulphite as a preservative. Sodium bicarbonate has sometimes been included in a similar dosage to the salicylate. Probenecid has been prescribed in a dosage of 0·5 g. four times daily. With either drug the patients have been instructed about the possible toxic effects and have been advised that, if these became severe, they should reduce the dosage accordingly.

a *b*

Fig. 1—Case I : *a*, right foot and left hand in December, 1949, before treatment; *b*, same foot and hand in October, 1950, after seven months' treatment with sodium salicylate. The ulcers were completely healed after three months' treatment.

Case-reports

FIRST CASE

A master butcher, aged 39, was first seen on Nov. 29, 1949. His symptoms began in 1936, when he had sudden severe pain in his left foot, which rapidly became swollen and red and shone "like a lantern." The pain lasted 2 weeks. After this he had at least one similar attack of joint pain in each of the next 8 years, the main joints involved being the big toes, the left instep, the knees, and the right hand. These attacks usually lasted about 2 weeks, but in 1942 and 1944 he had severe attacks of polyarthritis lasting 7 and 9 weeks. In 1944 he first noticed on his hands tophi, which have progressively enlarged. In 1946 he noticed a swelling on the dorsum of his right foot, near the base of the big toe. In the same year he developed recurrent ulceration of the fingers, and he has since had one or other finger bandaged continuously. Between 1944 and 1948 he had about twelve attacks of acute joint pains, each lasting about a week.

In April, 1948, he had a very severe attack of generalised joint pains lasting 14 weeks. During this illness he lost 2 st. in weight, and it was several months before he felt reasonably fit again. Since this attack he has been unable to walk further than a quarter of a mile, or to stand for longer than half an hour at a time because either of these exertions caused him pain in his right foot, persisting for several hours. At this time he was forced to abandon his hobby of horse-riding, because the pain and ulceration in his fingers prevented him from holding the reins.

From July, 1948, onwards he had attacks of joint pains at about 3-month intervals. In early October, 1949, the swelling which had first appeared on his right foot in 1946 and had gradually enlarged became very painful, and after 3 days it burst and discharged white material. Pain was thus relieved but the large ulcer remaining had shown no signs of healing under dry dressings at the time of admission eight weeks later, on Dec. 8, 1949.

The patient's mother and maternal grandfather had had gout.

Examination and Investigations

He was a cheerful and rather obese man with severe tophaceous gout involving mainly the hands and right foot (fig. 1). There was a large ulcer on the inner aspect of the right foot, overlying a tophaceous mass the size of an orange. Tophi distorted several fingers, and ulcers were present on the little and index fingers of both hands. A large tophus surrounded the metacarpo-phalangeal joint of the left index finger, and a tophus was present on the dorsum of the right wrist. There was nodular enlargement of both olecranon bursæ. Apart from gout, no physical abnormalities were detected.

Thirty-five determinations of the serum uric-acid level during non-therapy periods ranged from 6·5 to 17·4 mg. per 100 ml. (mean 10·6 mg.). The urine was free from albumin. The blood-urea level was 18 mg. per 100 ml. Radiography of the hands and right foot showed severe gouty arthritis, with much destruction of bone at the right first metatarso-phalangeal joint.

Treatment and Progress

Therapy with sodium salicylate gr. 30 t.d.s. was begun on March 10, 1950, and continued until July 17, 1952. The patient never acquired a tolerance towards salicylates, and throughout treatment he had repeated attacks of tinnitus and deafness with occasional episodes of minor mental confusion. At these times he had to reduce the dosage of salicylate to a point at which the serum uric-acid level was not well controlled. On July 17, 1952, further salicylate was stopped, and he has since received probenecid 2 g. daily with no untoward effects.

The serum uric-acid level was maintained at a mean of 6·2 mg. per 100 ml. during salicylate therapy and 7·3 mg. during probenecid therapy. The tophi have not enlarged. All the ulcers healed within 3 months, and the only recurrence involved the tophaceous mass on the right foot; this mass broke down on Dec. 9, 1952, discharged much tophaceous material, and healed completely in 2 months.

The persistent joint pains gradually diminished, and since July, 1951, the patient has been able to carry out the full duties of a butcher—which for the previous 5 years was impossible—and to ride a horse again. In December, 1951, he reported that he now rarely had discomfort in any joints and could walk long distances. Up to that time he had had three attacks of acute gout since starting treatment, but since then his only joint pain came on in December, 1952, in association with the sudden swelling and bursting of the tophus on the right foot. Since December, 1952, he has remained free from any joint discomfort. In May, 1953, he bought normal-fitting shoes for the first time in 10 years, and he has been able to continue wearing them.

SECOND CASE

A plasterer, aged 53, was first seen on Aug. 4, 1950. His symptoms began in 1938, when pain suddenly developed in both feet, which rapidly became swollen, red, and shiny, the attack lasting 2 weeks. Since then he had had similar attacks, especially in the feet, at the rate of about five a year. They had lasted 3–16 weeks, and he was usually confined to bed. The attacks tended to last longer and to involve multiple joints, recently the knees and hands being also affected. During this period of 12 years he had more or less continuous discomfort and weakness of the feet and ankles, preventing him from walking further than half a mile in a day. He had worn surgical boots for a year and had required two walking-sticks for the past 4 months. He had been unable to attend work for a total period of about 3 years in the past 12.

His father had gout.

Examination and Investigations

The right wrist was swollen and painful; the proximal interphalangeal joint of the left index finger and both first metatarso-phalangeal joints were swollen. There was limited painful movement of both knees.

Twenty-two determinations of serum uric-acid level ranged from 4·3 to 5·7 mg. per 100 ml. (mean 5·0 mg.). The blood-urea level was 30 mg. per 100 ml.

Treatment and Progress

Therapy with sodium salicylate gr. 30 t.d.s. was begun on Aug. 28, 1950, and this dosage was later raised to gr. 35 t.d.s. The patient has never experienced any symptoms of salicylism.

The serum uric-acid level was maintained at a mean of 3·5 mg. per 100 ml. Within 3 months of the start of salicylate therapy all the chronic symptoms had entirely disappeared, and the patient has been able to walk painlessly and as far as he likes. He has not lost a single day's work. He continued to have repeated but slight attacks of acute gout until April, 1952, by which time he had had nine attacks since treatment was started. He has remained free from all symptoms of gout during the past 3 years.

THIRD CASE

A butcher, aged 62, was first seen on Jan. 10, 1951. His first relevant symptoms occurred 8 years previously, when, after gardening, he developed sudden pain, swelling, and redness of his left foot. His right foot was similarly affected a few days later, and pain persisted for 8 weeks. Since that time he had had repeated severe attacks of joint pain every month or two, each attack lasting about 10 days. The main joints involved had been the metacarpo-phalangeal joints of the index and middle fingers of both hands, the big toes, and the insteps. For 3 years he had continuous pain and swelling in both hands and pain in the feet after standing a few hours. His work had been seriously affected by his symptoms.

There was no definite family history of gout.

Examination and Investigations

The metacarpo-phalangeal joints of the index and middle fingers of both hands were much swollen. The grip was poor in both hands. The lumbar and dorsal spine was fixed, and radiography showed gross ankylosing spondylitis. (The patient had never had any backache and was unaware of his spinal condition.)

Seventeen determinations of serum uric-acid level ranged from 5·3 to 12·0 mg. per 100 ml. (mean 7·9 mg.). The blood-urea level was 22 mg. per 100 ml.

Treatment and Progress

Therapy with sodium salicylate gr. 30 t.d.s. was started on March 1, 1951. For 3 months the patient had attacks of tinnitus and deafness but could always avoid these by reducing the dosage to about gr. 80 daily. After this time he was able to return to the original dosage and remained free from further symptoms of salicylism.

The serum uric-acid level was maintained at a mean of 3·5 mg. per 100 ml. Within two months of the start of salicylate therapy discomfort and stiffness of the hands had disappeared and the patient could carry out the full duties of a butcher for the first time in 3 years; all the swelling of the hands had disappeared after 6 months' treatment, and so had the discomfort in the feet. Acute attacks of gout occurred 4 days and 6 weeks after the start of treatment. The patient remained symptom-free from September, 1951, until he was last seen in March, 1953, when further treatment was discontinued. In April, 1955, he wrote saying that he had remained free from symptoms of gout and had had no further treatment.

FOURTH CASE

A solicitor, aged 49, was first seen in April, 1951. His symptoms had begun 14 years previously (at the age of 35), when he was awakened by severe pain in the right big toe, which was swollen, red, and shiny. The attack resolved within a week, but a few months later a more severe attack affected the same joint. Since that time he had had at least six attacks of acute arthritis each year, at first restricted to the big toes but later involving the ankles and hands. For 8 years he had had continual slight pain and stiffness in the feet and ankles, making walking difficult and long walks impossible, a distance of two miles always causing severe pain lasting several days. During these 8 years he had noticed progressive development and enlargement of tophi of the hands, which later caused difficulty in writing. A tophus had been excised from the right index finger in 1948 and another from the right middle finger in March, 1951.

The patient's father had had gout.

Examination and Investigations

He was a plethoric man with fifteen tophi of the fingers, varying in size up to that of a cherry, and a tophus in the helix of the left ear. Flexion of the fingers was weak, and dorsiflexion of the wrist was limited by pain. The feet showed swelling of the first metatarso-phalangeal joints.

Fourteen determinations of the serum uric-acid level ranged from 6·7 to 11·9 mg. per 100 ml. (mean 8·6 mg). The blood-urea level was 18 mg. per 100 ml. Radiography of the feet and the right hand showed areas of bone replacement.

Treatment and Progress

Therapy with sodium salicylate gr. 30 t.d.s. was started on May 5, 1951. During the first three weeks the patient had nausea, tinnitus, and deafness, but since then he has been free from toxic symptoms, except of very occasional slight tinnitus and deafness.

Sodium salicylate was replaced by probenecid 2 g. daily from Oct. 2, 1953, to Jan. 23, 1954, and from March 20, 1954, to Oct. 2, 1954. On the third day of probenecid therapy the patient developed nausea, vomiting, and general malaise. The probenecid was discontinued for 3 weeks, after which it was given again with no further untoward effects.

The serum uric-acid level was maintained at a mean of 3·3 mg. per 100 ml. during salicylate therapy and 4·7 mg. per 100 ml. during probenecid therapy. Within 2 months of the start of treatment all the persistent joint discomfort completely disappeared for the first time in 8 years, and he could walk in comfort as far as he liked. Within 6 months of the start all the tophi had totally disappeared, and further radiography 2 months later showed recalcification of previous areas of bone replacement. Acute gouty attacks occurred fourteen times in the first 14 months of treatment, but, although this incidence was higher than previously, the severity of the attacks was much diminished. The patient has not had a single attack during the past 32 months, although previously he had had six attacks a year for 14 years.

In August, 1954, after 5 months' probenecid therapy, there was a gradual return of persistent discomfort in the knees and ankles, and by October, 1954, these symptoms had become as severe as at any time previously. During this period of probenecid treatment five determinations of serum uric-acid level ranged from 4·2 to 5·5 mg. per 100 ml. (mean 4·7 mg.). Further probenecid therapy was stopped and sodium salicylate was substituted in the former dosage. All the joint symptoms disappeared gradually and completely during the following 6 weeks.

FIFTH CASE

A coalminer, aged 31, was first seen in June, 1952. For 9 years he had been subject to attacks of acute arthritis involving the feet and ankles, the attacks occurring about four times a year and lasting for about 6 weeks. From the start of his symptoms he had lost 6–7 months' work in each year. The attacks were becoming more frequent and severe. For the same period of 9 years he had had persistent discomfort in the ankles, which were swollen every night on his return from work. He had limped throughout this time and had to spend each evening lying on the settee. Apart from work, the only time when he left home was to watch the Saturday football match, and he remarked that he was always crippled afterwards.

There was no family history of gout.

Examination and Investigations

He had swelling and limitation of movement of both ankles. Eight determinations of serum uric-acid level ranged from 9·8 to 13·8 mg. per 100 ml. (mean 11·5 mg.). The blood-urea level was 44 mg. per 100 ml.

Treatment and Progress

Therapy with probenecid was started on July 7, 1952, in a total daily dosage of 2 g. and has been continued. There were no untoward effects.

The serum uric-acid level was maintained at a mean of 5·9 mg. per 100 ml. After 2 months' therapy the patient experienced complete relief from discomfort and swelling of his affected joints for the first time in 9 years. During the first year of treatment he had four attacks of acute gout, each less severe than previously and promptly relieved by colchicine. He has remained free from all joint symptoms during the past 20 months and has not lost a day's work since the treatment began.

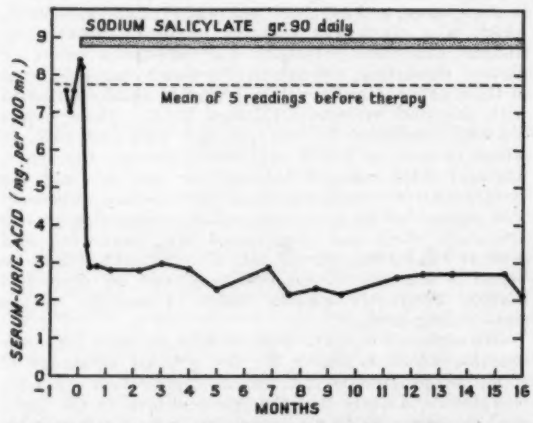

Fig. 2—Case 6: serum uric-acid levels during 16 months' treatment with sodium salicylate gr. 90 daily. Since the start of treatment no further attacks of acute gout occurred, and symptoms of chronic gout disappeared within four months.

SIXTH CASE

An accountant, aged 42, was first seen on Oct. 3, 1953. In 1933 (at the age of 22) he developed in both big toes sudden pain and swelling which lasted a fortnight, and after this he had similar attacks in one or other big toe at about yearly intervals. In 1940 he had a severe attack in the right hand, and in 1943, while in the Army, he was in hospital for 3 months with polyarthritis involving the feet, hands, elbows, and right knee. Since that time the attacks of acute arthritis had become more frequent, and he had had six attacks in each of the past 2 years.

He had previously been a keen hiker, but for 10 years he had had difficulty in walking, and for 4 years walking further than a mile had produced severe discomfort in the feet, lasting several hours. For 8 months he had been unable to walk more than a few yards, and this discomfort had been unaffected by colchicine therapy.

His father and paternal grandfather had had gout.

Examination and Investigations

He had an effusion in one knee, bilateral olecranon bursitis, and painful limited movement of both ankles. A typical attack of acute gouty arthritis of the left hand was witnessed on Oct. 10, 1953, together with a dramatic response to colchicine therapy.

Five determinations of serum uric-acid level ranged from 7·0 to 8·4 mg. per 100 ml. (mean 7·8 mg.). The blood-urea level was 21 mg. per 100 ml. Radiography of the hands and feet showed areas of erosion compatible with gout.

a b

Fig. 3—Case 6: a, right second metacarpophalangeal joint on Oct. 3, 1953, showing areas of bone replacement; b, same joint on Aug. 7, 1954, after 8½ months' treatment with sodium salicylate, showing recalcification.

Treatment and Progress

Therapy with sodium salicylate gr. 30 t.d.s. was started on Oct. 21, 1953, and has been continued at this dosage. For the first 2 days the patient had tinnitus, deafness, and muzziness; for 2 months he was subject to occasional slight deafness; but since that time he has been completely free from symptoms of salicylism.

Fig. 2 illustrates the serum uric-acid levels, which were maintained at 2·0–3·0 mg. per 100 ml. (mean 2·5 mg.). No further attacks of acute gout have occurred. Within 2 months of commencing therapy the patient had given up his car because of the pleasure of walking. Within 4 months his joints had become completely symptomless and he had a hiking holiday with no ill effects. The olecranon bursæ had disappeared by this time. Radiography on Aug. 7, 1954, showed recalcification of the eroded areas (fig. 3).

He has now received salicylate for 16 months, and has been free from symptoms during the past year.

SEVENTH CASE

A sales engineer, aged 51, was first seen on Oct. 21, 1953. For 20 years he had been subject to numerous attacks of acute gouty arthritis affecting the ankles, wrists, and fingers, and from the onset the longest remission had been for 3 months. Colchicine always relieved the exacerbations of intense pain in these attacks, but for nearly 20 years he had had in his ankles persistent pain and swelling, which were steadily increasing, and for 7 years he had had pain and swelling of various fingers, together with progressive development of tophi. For several years before his attendance he had been severely incapacitated with these chronic symptoms, and he had needed two sticks for 5 years.

His paternal uncle and grandfather had both had gout.

Examination and Investigations

Swelling and limited movement were present in many finger-joints, the wrists, ankles, big toes, and left knee. There were many tophi on the fingers up to the size of a walnut.

Two determinations of serum uric-acid level were 9·6 and 10·6 mg. per 100 ml. The blood-urea level was 44 mg. per 100 ml.

Treatment and Progress

From Oct. 25, 1953, the patient was treated with calcium aspirin gr. 100 daily till Nov. 28, 1953, when sodium salicylate gr. 90 daily was substituted. From the start he was subject to attacks of tinnitus and deafness, which did not diminish, and consequently on Feb. 20, 1954, further salicylate was stopped, and he was given probenecid 2 g. daily, which has been continued.

The serum uric-acid level was maintained at a mean of 3·3 mg. per 100 ml. during salicylate therapy and at 5·1 mg. during probenecid therapy. Within 2 months of the start of treatment the patient reported improvement, and by this time he was wearing ordinary shoes for the first time in 3 years. By February, 1954, all the tophi had almost disappeared, and by June, 1954, some 8 months from the start of treatment, all the persistent pain and swelling had disappeared, together with all trace of tophi. He had already discarded his sticks, which had been constant companions for 5 years. By September, 1954, he became able to walk long distances. He had four minor attacks of acute gout 3, 4, 5, and 9 months after treatment, but has now been free from all joint symptoms for 6 months.

Comments on Case-reports

All the patients experienced complete relief of chronic gouty symptoms and had no further acute attacks. The duration of treatment necessary to eradicate chronic symptoms varied from 2 to 21 months (see table) but was less than 6 months in five of the seven cases. Acute paroxysms ceased up to 33 months after the start of treatment but in only three of the seven patients did they cease within the first year of treatment. In one patient (case 6) no further acute attacks were observed after the onset of treatment, and this was one of only

RESULTS OF TREATMENT

Case no.	Age at first attendance (yr.)	Length of history of symptoms (yr.)		Average interval between attacks in 2 years before therapy (mos.)	Duration of therapy before arrest of symptoms (mos.)		Duration of present remission of acute attacks (mos.)
		Acute	Chronic		Acute	Chronic	
1	39	13	1½	4	33	21	26
2	53	12	12	2½	20	3	36
3	62	8	3	1½	1½	6	43
4	49	14	8	2	14	2*	32
5	31	9	9	3	12	2	20
6	42	20	10	2	0	4	18
7	51	20	20	1	9	8	6

* A relapse of chronic symptoms followed substitution of probenecid for salicylate; a return to salicylate induced a complete remission within 6 weeks.

two patients in whom recurrent attacks stopped before the relief of chronic symptoms.

In one patient (case 4) a relapse of chronic symptoms followed the substitution of probenecid for salicylate, but there were no further acute episodes. Probenecid maintained the serum uric-acid level in this patient at a mean of 4·7 mg. per 100 ml., compared with a mean of 3·3 mg. during salicylate treatment. A return to salicylate led to a further remission in symptoms. This case illustrates the individual variation in serum uric-acid level at which chronic symptoms are relieved. Symptoms recurred in this patient with a mean serum uric-acid level of 4·7 mg. per 100 ml. (range 4·2–5·5 mg.), but case 5 experienced complete relief of symptoms with a serum uric-acid level maintained at 6–7 mg.

Case 1 is a good example of severe tophaceous gout with ulceration. His unusual sensitivity to salicylate prevented the maximum lowering of the serum uric-acid level. This fact may explain the length of treatment required to eradicate his symptoms completely, and the fact that many of his tophi have remained clinically unaltered. Despite the persisting objective evidence of gross tophaceous gout, the patient is free from joint pain.

In one patient (case 3) treatment was stopped 2 years ago after a remission of symptoms which had lasted for 18 months. He has continued to remain free from all joint symptoms, whereas previously he had for 8 years had acute gout at least every 2 months.

Discussion

It may be objected that the remissions from attacks of acute gout are spontaneous. That this may apply to one or two cases cannot be denied, because such remissions are known to occur; but it is extremely unlikely that this should apply to the whole series. The patients were selected only in that they all presented with chronic gouty arthritis, their blood-urea level was normal, and they had been studied more than 18 months. As their histories relate, acute attacks of gout occurred frequently in all of them and were usually becoming progressively more frequent and severe when treatment was begun. In my experience long spontaneous remissions are mainly restricted to patients in whom symptoms have been limited to occasional acute episodes.

Gutman and Yü (1955), after noting the reduction in frequency and severity of acute episodes in chronic gouty patients treated with probenecid, dietary regulation, and regular colchicine prophylaxis, regarded colchicine as the main factor in minimising the recurrence of acute arthritis. This suggestion cannot apply to the present patients, in whom colchicine was reserved for the treatment of acute episodes and was never given prophylactically. Gutman and Yü probably failed to eliminate acute attacks completely because of the short duration of treatment, which was as little as 8 months in some cases, and because they mainly used probenecid, which is a much less effective uricosuric agent than sodium salicylate. Despite the additional effect of dietary regulation, the fall in the serum uric-acid level in their patients was much less than is usually obtained with salicylate treatment (Marson 1954). These points are well illustrated by Gutman and Yü's first case, in which in spite of initial probenecid therapy the serum uric-acid level was 6·5–8·0 mg. per 100 ml. and the symptoms were not alleviated. After 4 months probenecid was superseded by salicylate, which produced a greater uricosuric effect and maintained the serum uric-acid level at 3·3–5·5 mg. per 100 ml. The patient's symptoms began to improve for the first time, and his tophi had become noticeably smaller within 4 months of the start of treatment.

Reabsorption of urate deposits may continue for many months, which is shown by the gradual shrinkage of tophi and progressive radiological improvement. During this time it is likely that the uric-acid level in the tissue fluid in proximity to the dissolving tophi is appreciably higher than the level in the serum, and this may explain why acute paroxysms of gout can occur with normal levels in the serum. If this hypothesis is correct, perhaps acute gouty paroxysms stop when urate deposits have been completely absorbed, or when the remaining deposits are insoluble. It might be expected that only under these conditions would the uric-acid level in the tissue fluid be reduced to about the same as that in the serum and thereby protect the patient from further bouts of acute gout.

It is not disputed that long-continued therapy with uricosuric drugs is essential in the treatment of patients with chronic gout. The use of this form of therapy in patients in whom symptoms are limited to recurrent acute episodes will depend on the frequency and severity of these attacks and on the extent of relief obtained by the prompt administration of colchicine.

Summary

Effective control of the serum uric-acid level by continuous administration of sodium salicylate rapidly relieves the symptoms of chronic gouty arthritis. At first mild attacks of acute gout continue, but after a variable period all painful manifestations of gout are completely relieved.

Seven cases are described in which either sodium salicylate or probenecid was administered for periods of 18–60 months, and their progress during treatment has been recorded.

A suggestion has been made to explain the usual delay in cessation of acute attacks.

In one case a recurrence of chronic gouty symptoms followed the substitution of probenecid for salicylate. However, this drug is sometimes effective in relieving gout and is indicated in those patients who cannot tolerate salicylate.

Most of the work was done in the department of therapeutics of the University of Birmingham at the General Hospital, Birmingham. I am most grateful to Prof. A. P. Thomson for encouragement throughout the study; to Dr. R. Gaddie and his colleagues for numerous biochemical investigations; to various members of the consultant staff of the United Birmingham Hospitals for referring patients; and to Dr. D. Taverner for his useful criticism.

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NERVOUS DEGENERATION IN MALIGNANT DISEASE

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OF recent years a variety of neurological disturbances have been described in cases of carcinoma (usually of the lung) without obvious metastases in the nervous system. Though the published cases are few, they suggest that the degenerative process responsible for these disturbances has a predilection for certain well-defined parts of the nervous system, producing such conditions as sensory neuropathy and myopathy (Denny-Brown 1948), mixed motor and sensory neuropathy (Lennox and Prichard 1950), subacute cortical cerebellar degeneration (Brain et al. 1951), and proximal motor neuropathy (Hart 1954). These conditions may be in pure form, but often occur in various combinations (Henson et al. 1954, Heathfield and Williams 1954). Little is known about their ætiology.

The recognition of these disorders is important from the standpoint of surgery; for they may appear before the new growth has given rise to any other symptoms, and in many of the cases which have come to necropsy there has been only localised metastasis.

The case of bronchial carcinoma reported here was remarkable for its unusual neurological manifestations and the presence of porphobilinogenuria.

Case-report

A boilerman, aged 61, complained of cramps in his right calf about Christmas, 1953; in two weeks the cramps involved also his left calf. He continued to work twelve hours a day, but towards the end of January he could not walk and tended to fall forwards. After a period of rest in bed he was admitted to hospital in Sheffield in February, 1954. There the only abnormal physical sign found was depression of the knee-jerks; investigations, including lumbar puncture, were negative. He was thought to have a functional disorder but did not respond to pyschotherapy and was sent home to Ireland.

In May he was admitted to Daisy Hill Hospital, Newry. There the spasms were noted, but they did not at that time dominate the clinical picture; all the tendon reflexes were absent, and the right plantar reflex was extensor; a diagnosis of polyneuritis was made. The spasms of the legs increased in intensity despite large doses of barbiturates, and the patient was transferred to Claremont Street Hospital, Belfast, on June 12, 1954. He then complained of frequent severe painful spasms of the legs, loss of power and increasing stiffness of the legs, and weakness of the hand-grips; at no time did he complain of abdominal colic, except for one day before his admission to the hospital in Sheffield. In his previous history the only item of note was appendicectomy in 1930. There was no history of fits, exposure to toxic substances, or skin disorders. He was liable to have bronchitis in the winter.

Examination

He was powerfully built, well nourished, pleasant, alert, coöperative, and correctly orientated. His general health was good, and nothing abnormal was found in the cardiovascular and alimentary systems; numerous rhonchi and basal crepitations were heard in the chest. Blood-pressure 120/70 mm. Hg. There was a café-au-lait patch of pigmentation two inches in diameter in the lumbar region.

The cranial nerves were normal. There was slight weakness of the arms, particularly of the hand-grips, but the tone was normal. The small muscles of both hands were moderately wasted. The legs were rigid in extension, with the feet fixed in an equinovarus deformity. There were limited active and passive movements at the hip and knee-joints within a range of 15–20° and symmetrical wasting of both legs below the knees. Very slight passive movements were possible below the knees but caused pain. All the tendon reflexes were absent. It was impossible to test the ankle-jerks and plantar reflexes satisfactorily because of the contractures. The abdominal reflexes were absent. Light touch and pain sensation were unimpaired, but vibration sensation was absent in all limbs and in the trunk up to the clavicles. Muscle joint sensation was slightly impaired in the fingers.

The spasms consisted in an extensor spasm of the legs and trunk and slight adduction of the thighs; they were often protracted and accompanied by severe pain, causing the patient to cry out and break out in a sweat; they were spontaneous but at times could be precipitated by pulling back the bedclothes and by painful stimuli. Respiratory movements were restricted during the severe spasms, but the abdomen was not rigid; and during the spasms he had difficulty in micturition. At times the spasms were prolonged for many minutes but at others they recurred for hours, at intervals of seconds, exhausting the patient. The pain which accompanied them was described as shooting up the legs from the feet but it never spread to the trunk. The arms were not involved in the spasms, and there was no risus sardonicus. When lumbar puncture was done under general anæsthesia, increased passive movements were possible in the spine, hip, and knee-joints.

Course

On admission the patient had bronchopneumonia, which was treated successfully with penicillin and, later, streptomycin and chloramphenicol. On radiography on July 2, 1954, the chest was clear. When porphobilinogenuria was discovered, all barbiturates were stopped, and the painful spasms were treated with paraldehyde, pethidine, methadone hydrochloride ('Physeptone'), and finally morphine. Quinine, mephenesin, neostigmine, and atropine were tried in large doses but had no effect on the spasms. Large doses of vitamin B were given orally and intramuscularly.

In view of the low serum-cholinesterase values a transfusion of a pint of fresh blood, taken from a donor at the bedside, was given on July 17, without a reaction and without any effect on the spasms.

Intravenous gallamine triethiodide ('Flaxedil') 100 mg. was given by Dr. J. K. Dorman on July 19; in 15 minutes this produced muscular relaxation and the range of passive movements at the knee and hip-joints was increased within the limits of the contractures. The spasms almost completely disappeared when slight respiratory paralysis was present.

During the last fortnight of his life there was increasing œdema of the legs and dependent parts for which no cardiac or renal cause could be found; the serum-proteins were normal. In the last week he deteriorated rapidly, his temperature and pulse-rate rose, the spasms became very violent, and he died in hyperpyrexia on July 21, 1954.

Special Investigations

Urine.—Normal appearance; no albumin or sugar; sp. gr. 1·010–1·030. On July 6 porphobilinogen was found by the Watson and Schwartz method. On July 9 and 17 porphobilinogen, uroporphyrin, and urobilinogen were found. On June 18 a urinary chromatogram for amino-acids was normal.

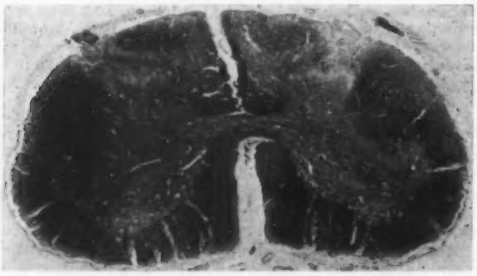
Lumbar puncture on June 14 produced cerebrospinal fluid under normal pressure and containing 55 red cells, 2 white cells, and protein 25 mg. per 100 ml., and no globulin; Wassermann reaction negative, Lange 2211100000.

Blood on June 17 contained Hb 13·7 g. per 100 ml., 14,600 white cells per c.mm. (neutrophils 73%, lymphocytes 21%, monocytes 6%); Wassermann reaction negative. On June 21 and July 1 the serum-electrolytes, including calcium and phosphorus, were within normal limits. On June 23 the cholinesterase number was 38 by modified Michel method (Aldridge and Davies 1952) in which the cholinesterase activity of the whole blood is expressed as 100 times the change in pH produced when 0·1 ml. of blood is incubated for 60 minutes at 25°C with acetylcholine as substrate. On July 15 the cholinesterase number was 58. On June 22 the blood-urea level was 39 mg. per 100 ml. On July 7 the blood-cholesterol was 235 mg. per 100 ml. On July 20 the serum-protein level was 6·2 g. per 100 ml. (albumin 3·9 g. and globulin 2·3 g.).

Electrocardiography on July 8 was normal.

Necropsy

Lying peripherally in the lower lobe of the right lung was a tumour 2 cm. in diameter. A few small secondary deposits



Lumbar cord showing demyelination of posterior columns, posterior root, and posterolateral columns. (Weil's myelin.)

were present in the hilar glands, but no tumour was found elsewhere in the body. The lungs showed terminal bronchopneumonia, and there was a healed tuberculous focus at the right apex. The other internal organs showed no significant variation from normal. Section of the brain and spinal cord revealed only a little greyish discoloration of the posterior columns of the cord.

Histology

The primary tumour and the deposits in the hilar glands consisted of an anaplastic carcinoma of oat-cell type. Sections of the other organs revealed no tumour or other significant findings beyond confirming the presence of mild bronchopneumonia. In the spinal cord demyelination was present in the posterior columns, the posterolateral columns, and the posterior nerve-roots (see figure). In the posterior columns this change was conspicuous and present at all levels of the cord; but in the posterolateral columns, where it largely involved the pyramidal tracts, and in the posterior nerve-roots, it was patchy and less extensive. Abundant foam-cells and large numbers of fat globules were noted in the degenerating columns. Some gliosis was present. No myelin degeneration was demonstrated elsewhere in the cord, in the anterior nerve-roots, or at representative levels in the brain. There was slight patchy lymphocytic infiltration of the pia of the cord, and numerous small perforating vessels showed lymphocytic cuffing in all areas of the cord; occasional small vessels in the brain-stem and basal ganglia showed this change. In the anterior-horn cells of the cord there was a large amount of lipofuscin pigment, which sometimes displaced the nucleus peripherally. Some of these cells showed slight chromatolysis, and a few were distended by large vacuoles. A slight excess of microglial cells was present in the anterior horns, but no neuronophagia was observed. Elsewhere in the cord and in the brain, including the cerebellum, there was no evidence of damage to nerve-cells. In three posterior-root ganglia examined many of the nerve-cells had been replaced by round partly calcified concretions but there was no capsular cell proliferation or evidence of active degeneration. Sections of peripheral nerve were taken from the radial, ulnar, sciatic, and posterior tibial nerves, and slight patchy wallerian degeneration was noted in the latter two. Sections of muscle from gastrocnemius, deltoid, and diaphragm were normal.

Discussion

The systematised nature and the character of the lesions in the nervous system of this case suggest that they are of similar nature to other nervous degenerations described in association with carcinoma. Several unusual features, however, were present. The involuntary movements which were so striking in this case have not been previously reported in this condition, and it is probable that they were related to the demyelination of the pyramidal tract, which demyelination has been observed in combination with other lesions in single cases by Brain et al. (1951) and Henson et al. (1954). The latter workers found pyramidal signs in 10 of 19 cases of carcinomatous neuropathy and myopathy, but the signs were only remarkable in 1 case (patient 1), which is the only published case so far in which pyramidal signs have been conspicuous.

In cases of sensory neuropathy associated with bronchial carcinoma, degeneration and loss of neurones in the posterior-root ganglia is constantly associated with degeneration of the posterior columns and peripheral nerves and has been held responsible for the peripheral and central change (Denny-Brown 1948, Heathfield and Williams 1954, Smith and Whitfield 1955). In the three posterior-root ganglia examined from the present case, many of the nerve-cells had been replaced by round partly calcified concretions. Capsular cell proliferation which has been a prominent feature in the cases referred to above was, however, absent. It is difficult to relate these inactive and relatively long-standing changes with the active degeneration present in the posterior columns and peripheral nerve.

Meningeal and perivascular lymphocytic infiltration similar to that described by Brain et al. (1951) and Henson et al. (1954) was found in the present case in areas of the cord in which no degeneration was found. This finding is in accordance with the belief of Henson et al. (1954) that this change is not caused by degeneration.

Porphobilinogen was detected in the urine of the present case, but the late age of onset, the absence of previous episodes, and the clinical features were unlike those of acute porphyria. The pathological findings in the nervous system in acute porphyria are somewhat variable, but systematised changes as in this case have not been described. Central demyelination has only rarely been reported and has then been slight and patchy (Courcoux et al. 1929, Baker and Watson 1945, Denny-Brown and Sciarra 1945). Watson (1954) mentions 11 cases out of many thousands tested in which porphobilinogenuria was present but which could not be readily classified as porphyria, though latent porphyria could not be excluded.

Since acute porphyria sometimes appears to be inherited as a mendelian dominant (Calvy et al. 1951), the available relatives of this patient were requested to submit specimens of urine for examination. Specimens were received from two sisters, a brother, and five children of the patient, but in none of them was porphobilinogen found. Although latent porphyria cannot be excluded on these grounds, the upset of porphyrin metabolism may possibly be of a secondary nature.

We cannot explain the two low serum-cholinesterase values; Henson et al. (1954) found a low serum-cholinesterase level in their case 19 and discounted it. Low serum-cholinesterase levels are found in liver disease and malnutrition (Aldridge and Davies 1952) and in organic phosphorus poisoning (Bidstrup et al. 1953).

Summary

A case is reported in which there was an unusual type of neurological disorder in association with a bronchial carcinoma which had not metastasised to the nervous system. Porphobilinogenuria and a low blood-cholinesterase level were also present.

Our thanks are due to Prof. J. H. Biggart for advice about the pathological aspects of this case; to Mr. D. Neill, M.SC., for the biochemical investigations; and to Prof. A. C. Stevenson for the follow-up of the patient's relatives.

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METABOLIC EFFECTS OF 9α-FLUOROHYDROCORTISONE AND OF CORTISONE IN ADRENAL INSUFFICIENCY

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THE activity of certain adrenal steroids can be much enhanced by incorporating a halogen atom into the 9α position (Fried and Sabo 1954). Reports suggest that in these new compounds the sodium-retaining activity is more increased than the glucocorticoid activity (Liddle et al. 1954, Goldfien et al. 1955); that the fluoro-compounds are more potent than their chloro-analogues (Liddle et al. 1954, Swingle et al. 1955); and that the sodium-retaining activity of 9α-fluorohydrocortisone (F.H.C.) approaches that of aldosterone (Liddle et al. 1954, Goldfien et al. 1955).

These new compounds are active when given by mouth and so might be more satisfactory than deoxycortone in the management of adrenal insufficiency. As a preliminary study we have compared the metabolic effects of F.H.C. and cortisone acetate in two patients, one with Addison's disease, the other after total adrenalectomy. The results confirm previous reports in man (Liddle et al. 1954, Goldfien et al. 1955) of the great potency of F.H.C. Further studies are being made to determine the lowest effective dose of this new compound for optimal electrolyte balance, whether it needs to be supplemented by a small dose of cortisone acetate, and to assess more precisely its glucocorticoid activity.

Clinical Material and Methods

Case 1, a single woman aged 53, had had a left radical mastectomy for cancer of the breast. 6 months before the present studies, a total adrenalectomy, preceded by irradiation of the ovaries, had been performed because of metastases in the skin. She had remained well on cortisone, and the skin lesions had enlarged only slightly. Case 2, a housewife aged 51, had had Addison's disease since 1938, and had remained well on deoxycortone acetate, supplemented later by cortisone. The last deoxycortone implant had been given 10 months before the present studies. Both patients had been receiving cortisone 50 mg. a day, and about 6 g. of added salt, for several months up to the start of the present studies.

On admission to hospital the patients were started on a constant diet with added sodium and potassium chloride.* Water intake was measured but not restricted. 3–5 days were allowed for equilibration before the first metabolic balance period. Cortisone and F.H.C. were given by mouth, half the daily dose at 9 A.M. and half at 9 P.M. The order of trial is shown in fig. 1.

Throughout the study the patients were encouraged to be up and about the ward. At fixed times each day the blood-pressure was taken and the weight recorded on scales sensitive to 2 g. at the weights concerned. Urine was collected over 24-hour periods ending at 9 A.M., and fæces in periods of 3–7 days. Blood was taken fasting at 8.45 A.M. on the last day of each balance period. At the same time the urea space was estimated as an index of total body-water (method of McCance and Widdowson 1951, with precautions described by Pawan 1954).

The following biochemical analyses were made: urinary sodium, potassium, chloride, creatinine, and nitrogen; fæcal sodium, potassium, chloride, and nitrogen; plasma sodium, potassium, chloride, bicarbonate, urea, proteins (plasma specific gravity), and hæmatocrit. The composition of the diet was determined by analysis of aliquots of three complete diets taken at different times during the studies.

The following special tests were made:

Mineralcorticoid function.—Salivary sodium and potassium levels were determined at different rates of salivary flow by the following technique: paraffin wax was chewed at varying speeds from 3 to 3.40 P.M. (i.e., 6 hours after a dose of steroid) and separate collections were made of all the saliva secreted during consecutive 5-minute periods. Saliva from the first period was discarded. This procedure was repeated at intervals, and the salivary Na/K ratios for the different periods were plotted against the corresponding rates of salivary flow.

Glucocorticoid functions:

	Hours after last dose of steroid
Fasting blood-sugar levels at 8.45 A.M.	11¾
Blood-eosinophil counts (venous) at 3.15 P.M. ..	6¼
Electrocardiograms at 2 P.M.	5
Water-diuresis tests (fasting) at 6 A.M.	9

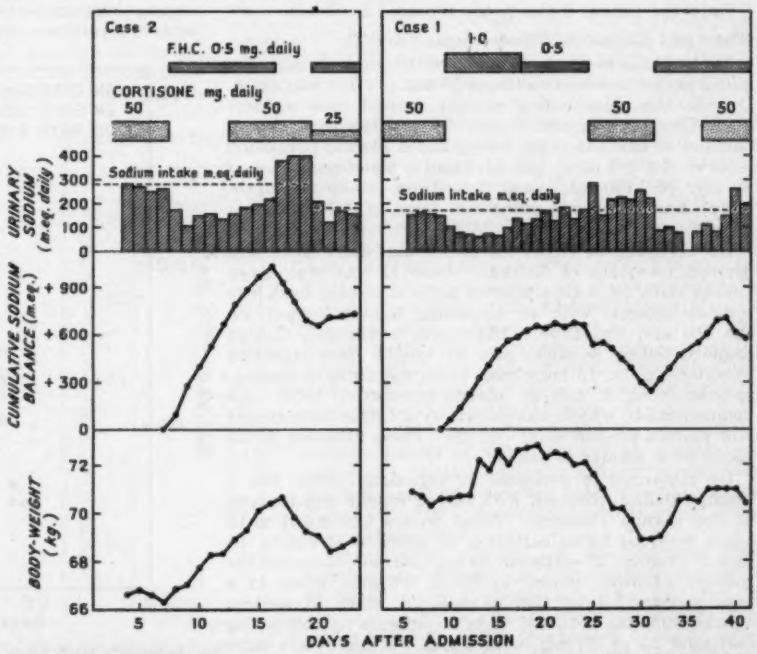

Fig. 1—Effects of cortisone and F.H.C. on sodium balance: interrupted line indicates sodium intake.

* In case 1 the sodium and potassium intakes throughout were 165 and 95 m.eq. respectively; in case 2 they were 280 and 95 m.eq. respectively, except in the last period, when the sodium intake was 180 m.eq. daily.

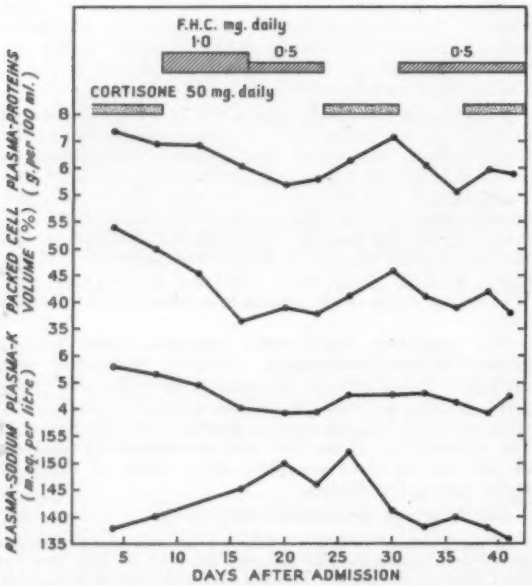

Fig. 2—Effects of cortisone and F.H.C. on plasma levels in case 1.

The water-diuresis test consisted in giving 1000 ml. of water between 6 and 6.30 A.M. and measuring the hourly outputs of urine and electrolyte until 9 A.M. It was not done on any day when blood was collected.

Urinary steroid outputs.—Urinary 17-ketogenic steroid and 17-ketosteroid excretions were estimated daily by a modification of the method of Norymberski et al. (1953). Urinary 17-hydroxycorticoids were estimated by Smith et al.'s (1954) modification of the method of Reddy et al. (1952).

Results

Only the salient findings are reported in detail.

Water and Electrolyte Balance (figs. 1 and 2)

Both patients were in sodium balance during the initial period in which cortisone 50 mg. per day was given. Despite this, biochemical studies showed that replacement therapy was not completely satisfactory. Case 1 (sodium intake 165 m.eq. daily) had a plasma-potassium level of 5·3–5·6 m.eq. per litre and a blood-urea level of 49 mg. per 100 ml. Case 2 (sodium intake 280 m.eq. daily) had a plasma-potassium level of 6·1 m.eq. per litre.

On changing to F.H.C. 0·5 or 1·0 mg. daily there was prompt retention of sodium. Case 1, who was given 1·0 mg. daily for 8 days, showed signs of coming back into sodium balance, with an increasing sodium output, on the 7th and 8th days. There was a parallel, though proportionately smaller, gain in weight from retention of water (fig. 1). In both cases there was a rise in plasma-sodium level, a fall in plasma-potassium level, and hæmodilution, which was shown by a fall in hæmatocrit and plasma-protein level (fig. 2). These changes in the blood were greater in case 1.

On returning to cortisone 50 mg. daily, there was a prompt sodium diuresis, with loss of weight and reversal of the plasma changes. These trends continued until again reversed by substitution or addition of F.H.C. In case 2 addition of cortisone 50 mg. did not interrupt the sodium retention caused by F.H.C. 0·5 mg., when on a high sodium intake (280 m.eq.). A state of sodium equilibrium was obtained in both patients by combining cortisone 25 or 50 mg. with F.H.C. 0·5 mg. while on a normal sodium intake (165–180 m.eq.).

Throughout these periods the chloride and sodium balances ran roughly parallel, and F.H.C. caused only a slight and transient increase in potassium excretion. Changes in total body-water (urea space) corresponded to those in body-weight. There were no significant changes in blood-pressure, despite excessive sodium retention.

In summary, the electrolyte effects of F.H.C. 0·5 mg. were clearly greater than those of cortisone 50 mg.

Salivary Electrolytes (fig. 3)

The salivary Na/K ratios at any given rate of flow were lower on F.H.C. than on cortisone. They tended to be lower still when the two steroids were combined. In case 1 there was no real difference between the effects of 0·5 and 1·0 mg. of F.H.C.

Glucocorticoid and Allied Effects (figs. 4 and 5)

Subjectively case 2 was equally well on either steroid. Case 1 felt less energetic, looked paler, and had slight diarrhœa during both periods on F.H.C. alone.

In both cases there was objective evidence that the glucocorticoid effects of F.H.C. 0·5 mg. were less than those of cortisone 50 mg., when measured at the same time after a dose of steroid. These differences were much greater in case 1.

The most consistent changes were in the electrocardiograms (fig. 4). The tracings, though normal on cortisone, showed marked flattening of the T waves in most leads when on F.H.C. These changes were not due to potassium loss or hypokalæmia. Similar changes are found in Addison's disease (whether untreated or treated with deoxycortone acetate) and are normally corrected by cortisone (Somerville et al. 1951).

The mean eosinophil-counts were higher on F.H.C. than on cortisone (fig. 5), the difference being clearly significant in case 1.

The mean fasting blood-sugar levels on F.H.C. were lower than on cortisone, but the differences were not significant (fig. 5).

Ability to excrete a water load in case 1 was only slightly subnormal on F.H.C.; the response was a little better on cortisone (fig. 5). The slight increase in sodium

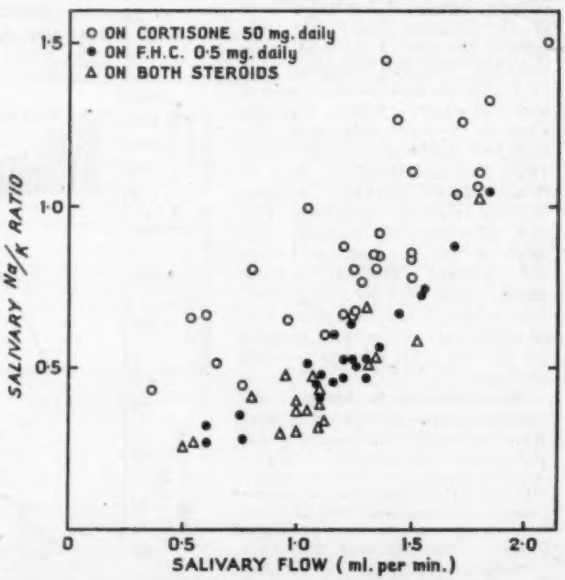

Fig. 3—Salivary Na/K ratios in relation to rate of salivary flow in case 1. Findings in case 2 were similar.

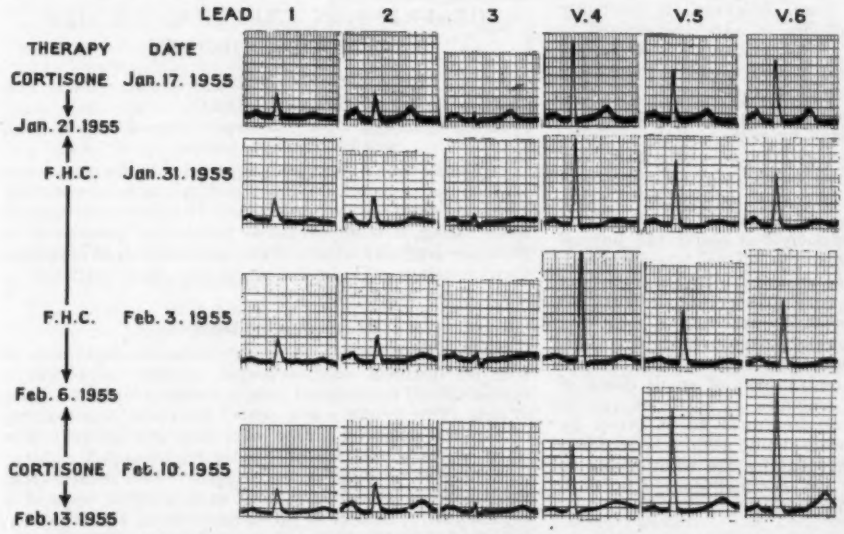

Fig. 4—Effects of F.H.C. on electrocardiograms in case 1, with voltage standardised at 10 mm. and all tracings made on same photographic (Elmquist) machine. Dose of cortisone was 50 mg. and of F.H.C. 0·5 mg. daily. Findings in case 2 were similar.

output during water diuresis on cortisone was not enough to account for the greater urinary volume.

Changes in nitrogen balance were not consistent, but the nitrogen excretion was slightly less on F.H.C. in case 1. In case 1 the mean daily creatinine output was 19% higher on cortisone than on F.H.C., suggesting that the glomerular filtration-rate may have been higher on the first steroid.

Urinary steroid excretion.—The results are shown in the accompanying table.

URINARY STEROID EXCRETIONS

Treatment (mg. daily)	Output (mg. per 24 hr.)					
	Case 1			Case 2		
	17-Hydroxy-corticoids	17-Ketogenic steroids	17-Keto-steroids	17-Hydroxy-corticoids	17-Ketogenic steroids	17-Keto-steroids
Cortisone 50	12·9	15·0	4·8	12·2	14·4	3·4
F.H.C. 0·5 or 1·0	0·3	0·8	0·4	2·8	1·2	1·3
Cortisone 50 + F.H.C. 0·5 ..	14·0	17·4	4·1	11·7	15·8	4·4
Cortisone 25 + F.H.C. 0·5 ..	..	..	..	5·4	7·6	2·1
Range in healthy females ..	4–12	4–14	5–15	..	..	..

Discussion

The few published reports on 9α-fluorohydrocortisone acetate have emphasised its extreme sodium-retaining activity. In the adrenalectomised dog its electrolyte effect was 180 times that of hydrocortisone (Swingle et al. 1955) and 4·7 times that of deoxycortone acetate (Liddle et al. 1954). In man the electrolyte effects of F.H.C. 0·5 mg. were equal to those of deoxycortone acetate 2 mg. and greater than those of hydrocortisone 25 mg. (Goldfien et al. 1955). The effective dosage for normal electrolyte balance therefore approaches that of aldosterone (Mach et al. 1954, Kekwick and Pawan 1954, Prunty et al. 1954, Goldfien et al. 1955).

Our findings confirm these earlier reports and leave no doubt that in adrenal insufficiency F.H.C. acetate 0·5 mg. has a much greater sodium-retaining action than cortisone acetate 50 mg., and that the mineralcorticoid activity of F.H.C. is therefore more than 100 times that of cortisone. This difference was also reflected in the salivary Na/K ratios, when allowance was made for the rate of salivary flow (Thaysen et al. 1954, Prader et al. 1955).

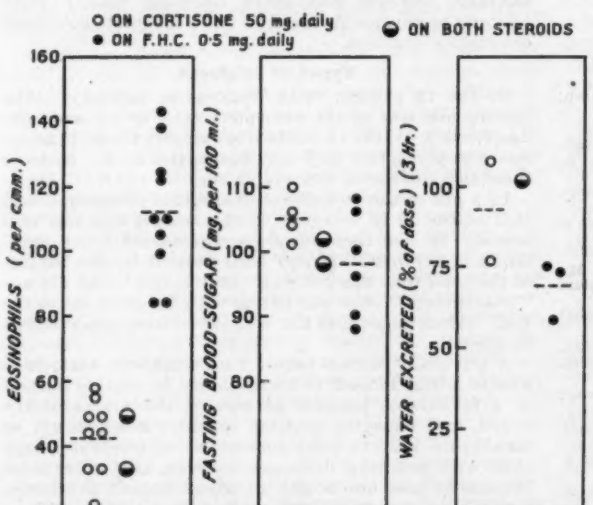
○ ON CORTISONE 50 mg. daily
● ON F.H.C. 0·5 mg. daily
◒ ON BOTH STEROIDS
EOSINOPHILS (per c.mm.)
FASTING BLOOD-SUGAR (mg. per 100 ml.)
WATER EXCRETED (% of dose) (3 Hr.)

Fig. 5—Comparison of certain glucocorticoid effects of cortisone and F.H.C. in case 1. Horizontal broken lines indicate mean values.

Published reports indicate that halogen-substitution also increases the glucocorticoid or cortisone-like actions of certain steroid hormones. Though these properties are more difficult to measure precisely than electrolyte activity, it has been shown that the effect of F.H.C. on the blood eosinophils is nearly 50 times that of hydrocortisone in man (Goldfien et al. 1955), and 10–20 times that of hydrocortisone in the adrenalectomised dog (Liddle et al. 1954). Again, in rheumatoid arthritis the anti-inflammatory effects of F.H.C. have been assessed as about 10 times those of hydrocortisone, but excessive sodium retention precludes the routine use of effective doses (Boland and Headley 1954, Ward et al. 1954).

Our findings, though not allowing any close comparison between the glucocorticoid potencies of these steroids, show that F.H.C. 0·5 mg. is less active in this respect than cortisone 50 mg. F.H.C. 0·5 mg. certainly appears to have some glucocorticoid activity, shown, for example, by

the water tests. This dose, however, is probably insufficient for full maintenance of adrenalectomised or addisonian patients. Case 1 was definitely less well when receiving F.H.C. 0·5 mg., and in both patients there were significant electrocardiographic changes.

In our experience cortisone, unless given in unphysiological doses or supplemented by extra sodium chloride, is often inadequate for the maintenance of satisfactory electrolyte balance in adrenal insufficiency. The patients studied were on cortisone 50 mg. a day and some extra sodium chloride during the initial control period. Their urinary glucocorticoid excretion was above the normal range, but, despite this, electrolyte balance was disturbed, with a tendency to hyperkalæmia and nitrogen retention. To correct this, a steroid with greater mineralcorticoid action is required. At present the best way of achieving this is by monthly injections of deoxycortone trimethylacetate (Thorn and Jenkins 1952, Spence 1953, Sorkin and Soffer 1953). The combination of small doses of F.H.C. with physiological amounts of cortisone (20–25 mg. a day) may enable all treatment to be given by mouth. Extra sodium chloride should seldom be required with this regimen. Further studies are being made to determine more precisely the optimal dosage of both steroids on a normal sodium intake.

Summary

The metabolic effects of 9α-fluorohydrocortisone acetate (F.H.C.) and cortisone acetate were compared in two patients with adrenal insufficiency.

The mineralcorticoid activity of F.H.C. 0·5 mg. a day was much greater than that of cortisone acetate 50 mg. a day, whereas the glucocorticoid effects were less. Adequate replacement was obtained by combining both steroids with a normal sodium intake.

We are indebted to Prof. Alan Kekwick for his encouragement and advice and for allowing us to study case 1 under his care. We wish to thank the clinical research committee of the Middlesex Hospital for facilities to work in the Institute of Clinical Research and for a personal grant to one of us (J. D. N. N.); the Courtauld Institute for some of the plasma estimations; and Sisters E. Few and A. Stoneman and Miss E. Wilkinson-Hughes, the principal dietitian, and their staffs, for their willing coöperation. This work was done during the tenure by one of us (O. G.) of a research fellowship from the Medical Research Council, who also provided the fluorohydrocortisone, which was part of a gift from Messrs. Merck & Co.

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DEAFNESS IN CEREBRAL-PALSIED SCHOOL-CHILDREN

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FOR some time it has been suspected that the prevalence of deafness in cerebral-palsied children is comparatively high. As the number of these children in special schools is increasing, it is important to know what proportion of them are deaf, and what difficulties are involved in testing their hearing. An investigation has been initiated to probe these problems.

Prevalence of Deafness

Pupils of three schools were examined, regardless of whether deafness was suspected or not. One was a special school for cerebral-palsied children up to 15 years of age. The second was a school for vocational training of cerebral-palsied children who had left school. The third was a school for physically handicapped children including 15 cerebral-palsied pupils. 89 children from these schools were tested, and as a control, tests of a representative sample of physically normal children from two secondary schools were carried out.

Testing was by pure-tone-threshold audiometry, and when necessary this was supplemented by voice tests.

In 18 (20%) of the 89 children there was deafness which could cause serious disability (category I): 12 of these were athetoids, 6 spastics. In 12 (14%) there was a significant hearing-loss in at least two adjacent frequencies, which—in unfavourable conditions—could cause difficulty in hearing speech (category II): 3 of these were athetoids, 9 spastics. (The total number of spastics was 55, athetoids 29, and ataxic 3.)

Only in 4 children had deafness been suspected before; in the rest it was discovered as a result of this investigation.

The distribution of the two categories of deafness within each school was very uneven. In school A, with 39 pupils, 4 were in category I and 4 were in category II. In school B, with 35 pupils, 11 were in category I and 5 were in category II. In school C, out of 15 pupils, 3 were in category I and 3 in category II.

Of the 80 children in the control schools 1 had a considerable bilateral conductive deafness, and 1 some bilateral perceptive deafness. 2 had a moderate unilateral conductive deafness.

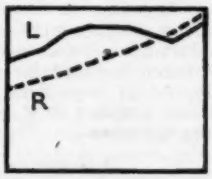
Types of Deafness

Of the 18 children with deafness in category I, the hearing-loss was of the perceptive type in 16, and conductive in 2. Of the 12 children in category II, the hearing-loss was perceptive in 9 and conductive in 3. None of these had disease of the middle ear.

In 4 out of the 18 cases of deafness in category I, and in 2 of the 12 in category II, the hearing-loss was unilateral. In 1 of these, deafness was caused by accumulation of cerumen. It had been noticed by the teacher of the class that this girl was "inattentive" and did not "concentrate." She was sitting with her good ear to the wall. After removal of the wax the hearing was restored to normal.

A physically normal person with unilateral deafness is able to adjust himself to his disability by placing himself in a favourable position as regards the source of the sound, and changing position quickly, if necessary, or turning the head in quick succession. A cerebral-palsied child with unilateral deafness, however, may suffer more because he may not be able to adjust himself physically, and in some circumstances the effect of one-sided hearing-loss may be the same as that of bilateral deafness. Of the two conductive types of deafness in category I, 1

was a case of bilateral deafness with the type of hearing-loss shown in the audiogram.



The examination of the ears did not reveal anything abnormal. This was a spastic child. It has been thought that a hearing-loss for low notes in a spastic person could be caused by an involuntary spasm of the tensor tympani muscle. This is a theoretical possibility which will be investigated in greater detail. The pathology of deafness in cerebral palsy generally is not discussed here.

Detection of Deafness

The detection of deafness in the cerebral-palsied child is difficult. In physically normal children a common reason for deafness being suspected is a speech defect or retarded development of speech. In a cerebral-palsied deaf child, whose articulation and voice are already affected by his neuromuscular defect, it is hard to point out the characteristics caused by the additional defect of hearing.

If a physically normal child does not respond in an accustomed manner to various sounds (turning, coming when called, carrying out requests) the suspicion is easily aroused that he may not have heard. In the cerebral-palsied child, a response in the form of physical actions cannot be expected, because he may not be able to carry them out.

Deafness in the cerebral-palsied is rarely a total or subtotal loss of hearing. They usually have moderate, or moderately severe, degrees of hearing-loss, mainly for the high-frequency sounds. In tête-à-tête conversation they may be able to follow familiar words or sentences; they may hear a variety of sounds even from a great distance; and so they appear, to the superficial observer, not to have any deafness.

The above examples show that one cannot rely in the cerebral-palsied children on the common signs which rouse suspicion of deafness.

Methods of Testing

Screening tests are not suitable, because test procedures must be modified individually.

One of the difficulties is to find out what type of signal a particular child can give so as to indicate that he hears the test sound. The audiometrician should be able to find out what is the most suitable procedure for each child. Many children are able to give a signal by word. Physical reaction to sound stimuli may, however, be delayed or altered. Smaller children may have to be conditioned to the sound stimulus to perform some simple manual operation, which must be sufficiently complex to leave no doubt that it is deliberate, and yet simple enough for the handicapped child to perform. In one of our cases the only suitable signal which left no doubt that the child heard the sound was by pressing the hand of another person in attendance.

Audiometricians engaged in this type of work should not only have experience in testing deaf children but should also be familiar with handling cerebral-palsied ones. They should realise that these children who are already at school are mentally normal, and that superficial appearances which are by the lay public ascribed to mental deficiency are grossly misleading. In fact the necessary preliminary explanation of the nature of the test is the easiest task, and there is no difficulty at all in making these children understand what is wanted.

Much depends on the patience and judgment of the audiometrician, who should be able to detect any signs of unreliability of response. Some involuntary movements may be mistaken for a signal. If there is any doubt about the reliability of response the test must be repeated another day. With some children the test should not be prolonged unduly because they may get too tired.

Testing can be carried out in any reasonably quiet room. The child should sit in a comfortable chair which does not produce any noise during the constant involuntary movements. The noise produced thereby can be considerable, and must be reduced to the minimum. For this reason the earphone sockets should be of the type which have a very high degree of noise attenuation.

Earphones usually supplied with clinical audiometers are made for adults. They are heavy and difficult to secure firmly to the ears of children by means of the headband supplied. Involuntary movements of the head may cause these earphones to slip or fall. Constant watch must be kept during testing that the phones fit well.

Earphones are required which are comfortable, attenuate the ambient noise, and are easy to handle and fit to the ears in such a way that movements of the head do not change the position of the earphone cushion. The attenuation of noise conflicts to a certain extent with requirements of comfort and bulk, and a compromise must be reached. Further experiments will be necessary to construct suitable earphones.

Undetected Deafness

In our sample of cerebral-palsied school-children 20% were deaf; and probably this underestimates rather than overestimates the general prevalence of deafness in these children. The comparatively low prevalence in school A is significant when it is related to the fact that pupils are selected for this school only if they are regarded as physically and educationally capable of getting full benefit from it, being of at least average mental ability. As detailed hearing-tests are not an established part of the otherwise very thorough examination of these children before admission, it is quite possible that some children considered to be of too low a standard were in fact deaf, and only seemingly backward. In the other two schools the prevalence of deafness was very much higher.

Compared with physically normal school-children, the prevalence of deafness in cerebral-palsied school-children is evidently several times higher. In our own control group we found only 5% of deafness. We used this group mainly as a control of our apparatus and testing methods. For comparison, the results of routine audiometric tests as carried out by the various educational authorities in junior schools are more suitable. I am informed that in the two large counties of London and Middlesex not more than 1% of school-children have some hearing-loss.

Summary

A survey of deafness in three different types of schools for cerebral-palsied children was made. 89 children were tested and in 20% a hearing-loss was discovered which could cause considerable handicap.

Screening tests are not suitable for cerebral-palsied children, because the testing procedures have to be individually modified according to the abilities of the child. A full audiometric test is necessary. Audiometricians should be specially trained for this type of testing.

The present type of commercial earphones used for the audiometer are not satisfactory and a new type will have to be designed.

It should be a rule that all cerebral-palsied school-children have a detailed hearing-test.

I wish to thank Miss J. Quinn and Miss M. Graham, audiology technicians, who did most of the testing of these children, for their help in the investigation. I am indebted to those in charge of the schools for cerebral-palsied children, and to the speech therapists to these schools, for the invaluable help and coöperation. Also my thanks are due to Miss E. Whetnall, director of the audiology unit, for encouragement to continue with this work.

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INTAKE OF VITAMIN D IN INFANCY

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WITH the recognition of the apparently new syndrome of "idiopathic hypercalcæmia in infants with failure to thrive" (Lightwood 1952) and its possible relationship to vitamin D (Lightwood 1953, Russell and Young 1954, Lowe et al. 1954, Creery and Neill 1954) a new interest has been aroused in the prophylactic use of this vitamin in infancy. Last February *The Lancet* said that "until we have more facts about vitamin-D intake it would be wise to assume that most babies in this country are getting more than they need. . . ." The present survey was made to obtain evidence on this point.

Material and Method

This series includes 90·1% of the babies residing in the City of Belfast and aged about 3 months in either April or May, 1955. This age was selected because it was thought that feeding habits would be well established and, in most cases, uncomplicated by the addition of solid foods. The inquiry was carried out by the health visitors of the maternity and child-health division of the Health Department in the course of their routine visits to the babies. For each child the following information was sought:

(1) The exact type of feeding which was being given and the brand of dried milk or cereal where applicable.

(2) The daily quantity of dried milk being consumed (in "measures" or "scoops") or liquid milk (in ounces) and the amount and type of cereal food if used.

(3) Whether or not a vitamin-D preparation was being given regularly at the time of the inquiry: if so, its brand and the amount given in twenty-four hours. The duration of therapy was not considered.

In a very few instances information along these lines was not forthcoming—because the child was in hospital or elsewhere, or because the family had moved away. A few children were excluded owing to lack of reliable information from their mothers. The total number of children included for the analysis was 1087, of whom 73 (6·7%) were held to have been prematurely born (birth-weight 5 lb. 8 oz. or less). No clinical assessment was attempted.

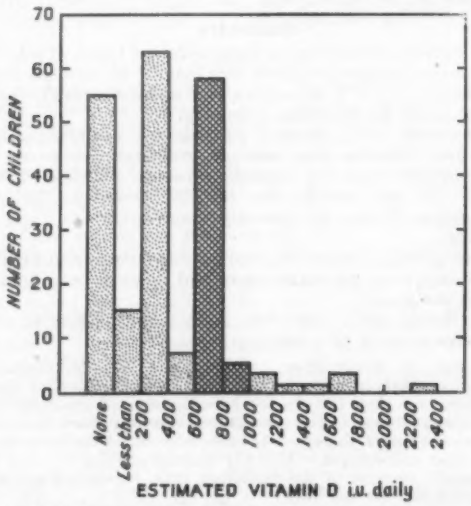

Fig. 1—Of 212 wholly or partly breast-fed babies 137 (74%) had vitamin-D supplements: 141 had cod-liver-oil compound (Ministry of Food); 8 had adexolin; 3 had halibut-liver oil; 3 had some vitamin-D-fortified dried milk or cereal; and 2 had other preparations.

Assessment of Vitamin-D Intake

Cod-liver-oil Compound (Ministry of Food) was the supplement most commonly used. Where a teaspoonful was said to be given, this was regarded as supplying 700 international units (I.U.). The directions on the label state that a small teaspoonful contains about 700–800 I.U.; many children will presumably be given more if larger teaspoons are used; so we feel that our figures will often tend to understate the vitamin-D intake from this source. Where "drops" of this oil were referred to we regarded 2 drops as equivalent to 1 minim. The results of experiments by two hospital pharmacists indicates that this again probably represents a slight underestimate of the vitamin-D content.

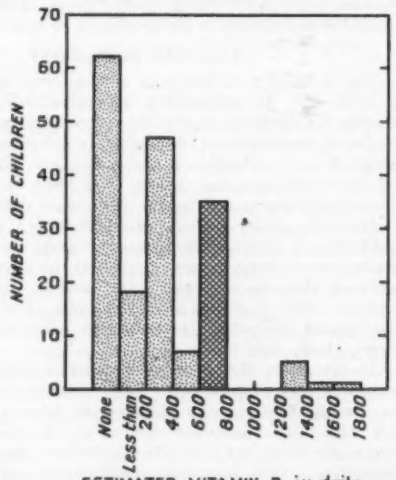

Fig. 2—Of 176 babies fed on liquid cow's milk 114 (64·2%) had vitamin-D supplements: 79 had cod-liver-oil compound; 22 had adexolin; 6 had halibut-liver oil; 2 had vitamin-D-fortified cereal; and 5 had other preparations.

Other Preparations Containing Vitamin D.—The vitamin-D content of these was taken as being that declared by the manufacturers or by Asher (1945) in her review of vitamin dosage.

Dried Milks and Cereals Fortified with Vitamin D.—Here the vitamin-D content was taken from the lowest figure given by the manufacturer: 280 I.U. per ounce of powdered milk for National dried milk, and 320 I.U. per ounce for proprietary brands. For all the dried milks a "measure" or "scoop" was considered equivalent to 1 drachm. The lack of standard procedure in measuring out dried milks has been discussed by Hytten and MacQueen (1954). We believe, however, that 1 drachm is near the quantity most commonly given when a "measure" or "scoop" is used according to the instructions. Cereal preparations were rarely given. Where they were used, "teaspoonfuls" were generally referred to, and these were taken to be of average domestic size and filled level. By weighing a teaspoonful of the appropriate cereal the vitamin-D content was estimated by reference to the manufacturer's analysis.

Liquid Milk.—No account was taken of the small amount (about 0·3 I.U. per ounce) of vitamin D normally present in liquid milk.

Results

Of the 1087 infants 212 (19·5%) were being wholly or partly breast-fed at the time of the inquiry, 176

(16·2%) were being fed on liquid cow's milk, 351 (32·3%) on National dried milk, and 348 (32%) on proprietary brands of dried milk.

The results for each category of feeding are shown in figs. 1–4. The daily vitamin-D intakes were considered in increments of 200 I.U., and the histograms show the numbers of infants in each group. The hatched area in each figure represents those children whom it is considered are probably receiving an adequate daily intake of the vitamin (600–1000 I.U.).

It will be seen that 10·8% of the infants had no added vitamin D, and 15·0% had less than 600 I.U. daily. These babies were almost all breast-fed (wholly or partly) or fed on liquid milk.

19·0% received 600–1000 I.U. daily, and 51·0% 1000–2000 I.U. daily. The great majority of the latter were infants fed on dried milks (National dried milk and proprietary brands).

4·2% received more than 2000 I.U. daily, largely infants fed on proprietory dried milks and receiving vitamin-D supplements in addition.

Discussion

It is evident that this type of investigation can give only an estimate of the vitamin-D intake of the children concerned, depending as it does on the subjective method of approach. Despite this obvious difficulty, the results seem to display an unbalanced state of prophylactic therapy with vitamin D for this group. For example, it is disturbing to find that 10·8% of the infants were having no supplement of vitamin D at a time of rapid growth and development. It is also noteworthy that 15·0% had an intake well below the figure of 700 I.U. daily, recommended as adequate for full-term infants by a subcommittee of the British Pædiatric Association (1943).

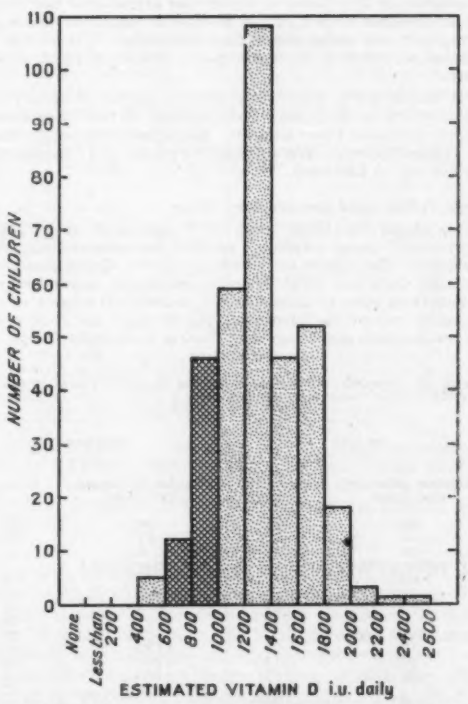

Fig. 3—Of 351 babies fed on National dried milk 249 (70·9%) had vitamin-D supplements: 208 had cod-liver-oil compound; 30 had adexolin; 4 had halibut-liver oil; and 7 had other preparations.

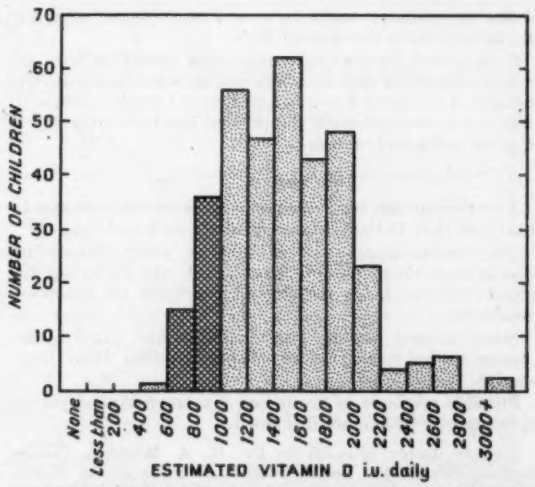

Fig. 4—Of 348 babies fed on proprietary brands of dried milk 263 (75·6%) had vitamin-D supplements: 172 had cod-liver-oil compound; 65 had adexolin; 16 had halibut-liver oil; and 10 had other preparations.

In the other direction it will be seen that more than half of these infants (55·2%) were apparently having amounts in excess of normal requirements. There is at present no clear proof that dosage of this order is generally dangerous, although Jeans (1950) stated that amounts of 1800 I.U. and more daily may give rise to anorexia, diminished intake of food, and retardation of linear growth. He regarded these as mild toxic manifestations of overdosage with vitamin D during a therapy usually considered reasonable and harmless. It seems wise to avoid this higher dosage unless it can be conclusively shown to be of corresponding benefit. Many authorities hold that prematurely born infants require more vitamin D than do those born at full term, but this seems doubtful in view of the work of Glaser et al. (1949), who have shown clearly that the premature infant has no increased need for vitamin D, the increased tendency to rickets depending on rapid growth and a shortage of calcium and phosphorus. 68·5% of the premature infants in this series were apparently receiving more than 1000 I.U. daily, 5·5% were having less than 600 I.U., and 4·1% were having no supplement of vitamin D.

How then can a more rational vitamin-D prophylaxis be achieved? In the first place it seems clear that more attention should be paid to ensuring an adequate vitamin-D intake for breast-fed infants and for those fed on liquid milk. The problem of the "more than adequate" vitamin-D intake is by no means so simple. If vitamin-D fortification of dried milks and infant cereals is to continue at its present level much could be done by advising that additional supplements of the vitamin are unnecessary. On the other hand, it is probably desirable that the policy of giving some supplement of vitamin D should be maintained, if only to accustom the infant to it against the time when liquid milk is substituted for dried milk. It can also be argued that it would be unwise to cease altogether the practice of adding the vitamin to dried milk and relying entirely on supplements; for the results of this survey suggest that about 25–30% of infants fed in this way would receive no vitamin D.

The solution to this problem may lie in a compromise between a reduction in the amount of the vitamin added to dried milk and cereals and the giving of a smaller daily supplement than is at present usual. The amount

of the supplement could be varied as required to bring the daily total to the desired level.

It may well be that this suggestion would be hard to put into practice, and it is only put forward as a possible method of attaining a more controlled intake of vitamin D than is now feasible with the present level of fortification of dried milks and cereals.

Summary

An attempt has been made to estimate the vitamin-D intake of 1087 Belfast infants aged about 3 months.

The results appear to show that many breast-fed infants and those fed on liquid milk are receiving no added vitamin D or insufficient amounts by accepted standards.

Many infants fed on vitamin-D-fortified dried milks appear to be having more of the vitamin than they require.

Possible methods of producing a more balanced policy of vitamin-D intake are discussed.

We are deeply grateful to Dr. H. A. Warnock (senior medical officer), the health visitors, and the clerks of the maternity and child-health department of Belfast Corporation for their wholehearted interest and coöperation in this investigation. We are also indebted to Prof. F. M. B. Allen; to Miss I. Stevenson, dietitian, Royal Belfast Hospital for Sick Children; to Mr. J. H. Restrick and Mr. G. E. McIlhagger, pharmacists, Royal Victoria Hospital, for their helpful advice; and to Miss N. Hunter for secretarial assistance.

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EFFECT OF TRIIODOTHYROACETIC ACID IN A CASE OF MYXŒDEMA

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Triiodothyroacetic acid (triac) differs from triiodothyronine in that the tyrosine side-chain has been replaced by acetic acid. Pitt-Rivers (1953) has shown that this substance prevents thiouracil-induced goitre in the rat and raises the oxygen consumption of intact animals. Thibault and Pitt-Rivers (1955) found that it also had an immediate effect on the oxygen consumption of isolated kidney slices, the observed rise being at a maximum in 15 minutes. They also found that single injections increased the oxygen consumption of thyroidectomised rats within 2 hours. On giving triac to two myxœdematous patients by daily intravenous injection, Lerman and Pitt-Rivers (1955) observed clinical improvement, with a fall in blood-cholesterol and in body-weight, but with no change in basal metabolic rate (B.M.R.). It is possible that a transient rise in B.M.R. occurred but was not detected, because the injections were given in the afternoons, and the B.M.R. measurements were made in the mornings.

In the case to be described, an attempt was first made to determine whether the B.M.R. rose within a few hours of an intravenous injection of triac. Subsequently triac was given orally. When it had been found to be effective by that route, an attempt was made to determine the time of the maximum effect of single oral doses on the B.M.R.

Methods

B.M.R. measurements were all based on oxygen consumption estimated with Benedict-Roth apparatus. All the figures (except in the repeated tests following intravenous injection) represent the average of two 10-minute estimates; the values agreed well in all cases. Results are expressed as percentages of average normal by Aub-Dubois standards, using the patient's initial weight to estimate surface area. If the patient's final weight is used, the results should be multiplied by 1·04. To convert to Robertson and Reid (1952) standards the results should be multiplied by 1·13.

For intravenous injection triac was dissolved in faintly alkaline physiological saline solution to give a 0·1% solution, and autoclaved. The autoclaved solution was chromatographed by Dr. R. Pitt-Rivers, and appeared to be unchanged. Oral doses were given either as a faintly alkaline solution (1 mg. in 15 ml.) or as 1 mg. tablets made up with a carbohydrate base.

Case-report

A builder's labourer, aged 58, had continued at work until a week before his admission. The immediate symptoms which brought him to hospital were breathlessness, weakness, and pallor; these had been present for a few weeks. During the previous 2 years he had also noticed generalised aches and pains, loss of hair, dry skin, and increased sensitivity to cold. On admission there was pallor of his mucosæ. His face was puffy and his skin dry, rough, and thick. He had no axillary hair, and his pubic hair was scanty. His thyroid was not palpable.

At the time of admission the hæmoglobin was 36%. The anæmia was normocytic and the marrow normoblastic. A transfusion of $2^1/_2$ pints of blood was given, and the hæmoglobin increased to 60%, at which level it remained unchanged throughout the subsequent investigations. There was no evidence of bleeding from the gastro-intestinal tract or elsewhere.

The initial B.M.R. was −35%, and the uptake of radio-iodine was only 4% in 24 hours. Radiography of the chest showed a much increased heart shadow. Electrocardiography showed low-voltage curves. The urinary excretion of 17-ketosteroids was 6·9 mg. in 24 hours.

Single Intravenous Injections of Triac

Two single injections (each of 5 mg.) were given (at an interval of 3 days) before the patient had received any other treatment. The results are shown in table I. Conditions at the first test were not ideal, because interested spectators were present from time to time. At the second test no-one entered the room except the observer, and perhaps for that reason the results were more regular. During both tests the patient

TABLE I—EFFECT OF SINGLE INTRAVENOUS INJECTIONS OF TRIAC (5 MG.)

1st test		2nd test	
Minutes before or after triac	B.M.R. (%)	Minutes before or after triac	B.M.R. (%)
−60	−29	−30	−30
−45	−31	−10	−30
−30	..	0	..
(I.V. saline solution 5 ml.)		(I.V. triac 5 mg.)	
−20	−6	+30	−30
−5	−21	+60	−30
0	..	+75	−30
(I.V. triac 5 mg.)		+90	−26
+10	−28	+105	−28
+25	−15	+120	−31
+40	−3	+150	−29
+55	−31	+180	−4
+90	+26	+195	−27
+120	−29		
+180	−22		

appeared perfectly calm throughout, and his pulse-rate did not vary. Nevertheless the preliminary injection of saline solution had a clear, though transient, effect on the B.M.R., showing that he was susceptible to psychological influences. In the first test a similar rise in B.M.R. followed the injection of triac, and at 90 minutes after the injection there was a very much greater rise. In the second test there was a smaller rise at 180 minutes after the injection. Both these rises were transient, and it is doubtful whether they can be attributed to drug action. In summary, the result of these preliminary tests can only be described as inconclusive.

4-hourly Oral Administration of Triac

After the oral administration of 1 mg. of triac (in solution) every 4 hours there was a sharp fall in weight and plasma-cholesterol level and an equally rapid rise in B.M.R. (see figure). At the same time the patient's clinical condition improved rapidly: he felt stronger and warmer, and his pains decreased: the puffiness disappeared from his face, and his skin became normal in texture. The size of the cardiac shadow in the chest radiograph decreased considerably, and electrocardiography showed increased voltage of the T waves.

After 10 days' treatment triac was withheld for 24 hours The B.M.R. fell to −18%; but, as this was well above the basal level of −30%, it seemed that some calorigenic effect still persisted. For the next 2 days he received 1 mg. 4-hourly, except that none was given in the 4 hours preceding estimation of the B.M.R. The B.M.R. remained at −15%, indicating that the calorigenic effects previously observed had not been entirely due to the immediate action of the drug.

Single Daily Oral Doses of Triac

Finally the dosage was maintained at 2 mg. daily given as a single oral dose in the form of tablets. The time of administration was varied, but the time of the B.M.R. estimations was kept constant (9 A.M.). During the 24 days that he received this dose the patient's skin and facial appearance remained normal and his weight was steady. The size of the heart shadow decreased further, though the T waves in the electrocardiogram became a little flatter. Nevertheless the plasma-cholesterol level rose towards it former level, and the B.M.R.

TABLE II—EFFECT OF VARYING INTERVAL BETWEEN DOSE OF TRIAC AND ESTIMATION OF B.M.R.

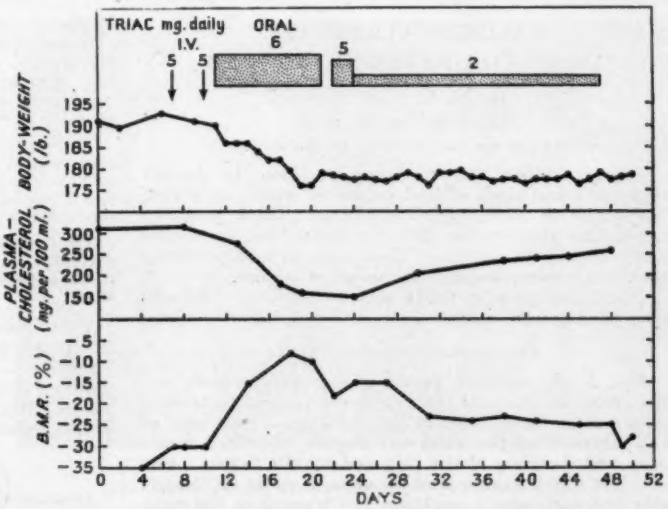
Interval between last dose of triac and B.M.R. estimation (hr.)	B.M.R. (%)	Interval between last dose of triac and B.M.R. estimation (hr.)	B.M.R. (%)
1	−25	15	−25
3	−24	23	−23
7	−23	39	−30
11	−24	63	−28

The patient was receiving 2 mg. of triac daily by mouth. This was given as a single dose at different times of day or night, to vary the interval between the last dose of triac and the time of the B.M.R. estimation (always done at 9 A.M.). The last 2 figures in the table were obtained after triac had been discontinued for 2 days.

fell to about −24%. This figure did not vary appreciably, whatever the interval between the daily dose of triac and the time of the estimation (table II); but, when triac was withheld for 2 days, the B.M.R. fell slightly to about its original level (−28%, −30%).

Discussion

In a case of myxœdema the initial effect of triac was similar to that of thyroxine or triiodothyronine in that the clinical signs of the disease were abolished, and the B.M.R. and plasma-cholesterol level reverted to normal. This result was achieved by oral administration, though the dose used was very large compared with the usual doses of thyroxine or of triiodothyronine. The effect of triac was very rapid, but not more rapid than would be expected after large doses of triiodothyronine.



The effect of triac on body-weight, plasma-cholesterol level, and B.M.R.: 2 isolated intravenous doses of 5 mg. each were first given; after this, triac was given orally.

After a remission had been obtained with 6 mg. daily, the dose was reduced to 2 mg. daily. During 24 days at this dosage the patient remained clinically euthyroid, but the B.M.R. and plasma-cholesterol level reverted towards their original values. The absence of clinical signs of myxœdema during this period may merely mean that insufficient time had elapsed for the reaccumulation of water and mucoproteins. However, Lerman and Pitt-Rivers (1955) also observed an apparent dissociation between the effect of triac on the clinical signs and on the B.M.R. In their two cases the signs of myxœdema disappeared before there was any evident effect on the B.M.R.; but the B.M.R. might have risen if treatment had been continued longer. An alternative suggestion would be that triac has a greater effect on the retention of water and mucoproteins than it has on other aspects of metabolism. This suggestion seems worth exploring, although the evidence in its favour is at present slight.

Summary

In a case of myxœdema triiodothyroacetic acid (triac) in oral doses of 6 mg. daily rapidly reversed the clinical signs of the condition. The B.M.R. and the plasma-cholesterol level returned to normal.

When the patient was given single daily oral doses of 2 mg. the B.M.R. and the plasma-cholesterol level reverted almost to their original values, but clinical signs of myxœdema did not reappear.

Varying the interval between the daily dose of triac and the time of the B.M.R. estimation did not affect the result.

Attempts to determine the effect of single intravenous doses of triac on the B.M.R. were inconclusive.

I am indebted to Dr. R. Pitt-Rivers, F.R.S., of the National Institute of Medical Research for the supply of triac and for chromatography of the autoclaved solution; to Prof. M. Maizels and Dr. T. Telfer for the plasma-cholesterol estimations; and to the Sir Halley Stewart Trust for a personal grant.

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CALCIUM VERSENATE IN MOTOR-NEURONE DISEASE

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Kinnier Wilson (1940) drew attention to certain symptoms and signs of lead poisoning which were very like those of motor-neurone disease. Lead probably affects the whole motor unit, damaging both the motor neurones and the muscles. These cases of lead poisoning resembling motor-neurone disease must be rare.

The following case raises several unsolved problems both of diagnosis and of treatment.

The Patient and Her Illness

Mrs. A. B., aged 49, principal of a girls' school, was first seen on July 29, 1954, complaining of increasing weakness of the muscles of her right hand, especially of the extensors of the wrist and fingers. She had wrist-drop and dangling of the ring and middle fingers. She also had slight weakness of the same muscles on the left side and particularly weakness and wasting of the right interossei. At this examination there was no fasciculation and no sensory loss. The reflexes were normal and the plantar reflexes were flexor.

The picture suggested the possibility of lead poisoning and this was thoroughly investigated.

Previous History

As a young girl she suffered from migraine and urticaria. During a pregnancy in 1940 she had leucopenia and was given injections of liver. In 1942 she had a curious illness of unknown ætiology which appeared to have caused a spasm of the diaphragm. This recovered spontaneously.

As a young woman, about 20 years ago, she worked as an industrial chemist and handled lead acetate in considerable quantities. At present she lives in an old house receiving its water from a private supply in the Mendip Hills through old pipes, some of which are made of lead. She never drinks milk in any form, and may well have a low calcium intake.

It appeared, therefore, that this patient could have absorbed lead into her system in the past in several ways.

Investigations for Lead

The amount of lead in her blood was 0·05 mg. per 100 ml. (a normal figure), and her urinary excretion of lead was 0·0495 mg. in 24 hours (also a normal figure).

Course of Illness

At that time it was impossible to make a definite diagnosis and the patient was kept under observation. When she was seen again on Oct. 20 her muscular weakness had become much worse. She had increasing difficulty in writing, particularly on the blackboard; after walking she became extremely fatigued, and she had also noticed difficulty in driving her car for any length of time. Legs and arms were alike weak. On examination the muscles previously found to be weak were now weaker. There was also definite weakness in eversion and dorsiflexion of the left foot, with particular weakness of the right peronei and weakness and wasting of both the right and left interossei. There was also diminution of the right ankle-jerk, and to a lesser degree of the left ankle-jerk, as compared with the previous examination.

On Oct. 28 she was seen by Sir Charles Symonds, who considered that she was an unusual case of motor-neurone disease. He pointed out that the weakness was more extensive than the wasting and thought that the deterioration favoured motor-neurone disease.

On Nov. 4 the patient noticed fasciculation in her trunk, leg, and arm muscles. When an electromyogram was done on Nov. 7 at the Radcliffe Infirmary, Oxford, by Dr. B. Scott, definite fibrillation potentials were found, many being present in the muscles of the forearm on both sides and fewer in the right peronei.

At the same time a biopsy was done from the extensor muscles of the middle finger, and Dr. R. M. Norman, the neuropathologist in Bristol, reported that the lesion was probably neurogenic and not muscular.

Further Investigations

Radiographs of chest and cervical spine were normal. Hæmoglobin was 95% and white blood-cells 2200 (polymorphs 540, showing considerable neutropenia). Cerebrospinal fluid was normal in pressure and content: Wassermann and Kahn reactions in C.S.F. and blood were negative.

There was no basophilic stippling on the blood-film, and the lead content of blood and urine was normal. The blood-calcium was 9·1 mg. per 100 ml., and a course of dimercaprol and 50 mg. of parathyroid extract ('Parathormone') failed to produce any evidence of increased lead excretion.

The patient was again discharged from hospital, on calcium gluconate injections, with no definite diagnosis except a motor-neurone disease which was obviously becoming worse.

To summarise the condition, a disease of the motor neurones was present which everyone agreed was rapidly progressive. It had resembled lead poisoning, but no proof of this could be found. The only other finding was a fairly severe neutropenia, which had been found in this patient before.

Treatment

Because the clinical picture was so like that of lead poisoning, and was getting worse, it was decided to try calcium versenate injections, rather empirically. The chelating agents had been adapted to medical uses because of their marked affinity for heavy metals, and several cases of true lead poisoning had been successfully treated—e.g., by Bessman et al. (1952) in the United States and by Giles et al. (1955) in this country.

Chelating agents contain nitrogen or other atoms capable of giving up electrons to metals which require them to complete their atomic structure, and they are useful because the metal complex thus formed is stable, and non-toxic, and is excreted in the urine. They are administered as the calcium salt because of the danger of tetany from calcium loss and also because lead will displace the calcium. Lead is probably, like arsenic, bound to the sulphydryl groups in the body tissues. These agents have been used in chronic chrome ulcers, and for arsenic or mercurial poisoning. The treatment is not dangerous, since it does not materially interfere with copper and cobalt in human tissues.

Treatment with calcium versenate (calcium disodium ethylenediamine tetra-acetic acid; E.D.T.A.) was started in this case without much hope of success, but the apparent response to treatment was striking.

Daily injections (each of 2 grammes given in a litre of 5% dextrose solution) were given on the 4 days Dec. 30 to Jan. 2. The patient noticed spontaneous decrease in fasciculation, and 1–2 weeks later a marked improvement in both legs and arms, particularly in the extensor group of muscles. Within 3 weeks she could walk further, write much more easily, and also drive a car more easily. When she was seen in April, there had been further improvement, though her condition had been more static following the first month after treatment. Another course of five similar injections was given in April and again there was considerable improvement, particularly in the extensors of the right wrist. She could now lift a glass without difficulty and extend the fingers in one movement. Again she noticed that the fasciculations were much less; indeed they were hardly noticeable.

She was seen at Oxford on May 23 by Dr. Charles Whitty, who also found considerable clinical improvement. An electromyogram at Oxford on May 24 confirmed this.

Since May the improvement has steadily continued and a further course is contemplated. The maximum improvement has taken place, on each occasion, within the first month after therapy.

Discussion

The response in this case was unexpected, and the excretion of lead after calcium versenate treatment was not studied. In cases of lead poisoning treated with this agent excretion of lead reaches a maximum about 10–14

days after injections cease. We have no proof that in the present case lead was the toxic factor, and it is possible that the calcium versenate affected some other toxic element and caused its excretion.

It may, of course, be argued that the patient's improvement had nothing to do with the treatment given. Although I find this hard to believe, I must admit that spontaneous improvement is not very unusual in motor-neurone disease and that this was a somewhat atypical case. At any rate the method seems to deserve further trial, especially as motor-neurone disease is not a single entity and may arise from quite different causes, one of which may be hidden lead poisoning.

In the chelating agents we have a research tool which may well provide information on some of the chronic neurological diseases (*Lancet* 1955). The story of sway-back Derbyshire sheep (Innes and Shearer 1940), in which the tissue copper is lowered in ewes and lambs and a high content of lead is found both in the soil and in the tissues of affected lambs may indicate that these chelating agents could be of use in an experimental approach to demyelination in both animal and man.

In presenting this preliminary report on an apparently successful case I should add that I have so far tried the method in six other cases of motor-neurone disease. In four of these no improvement was evident, but the two other patients noted a considerable decrease in fasciculation following the injections and one of them seems to have more power in the damaged muscles. The effect of giving calcium versenate by mouth is being tried.

The usefulness of this therapy remains to be proved; but further investigation seems justifiable.

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CALCIFICATION WITHIN THE LIVER

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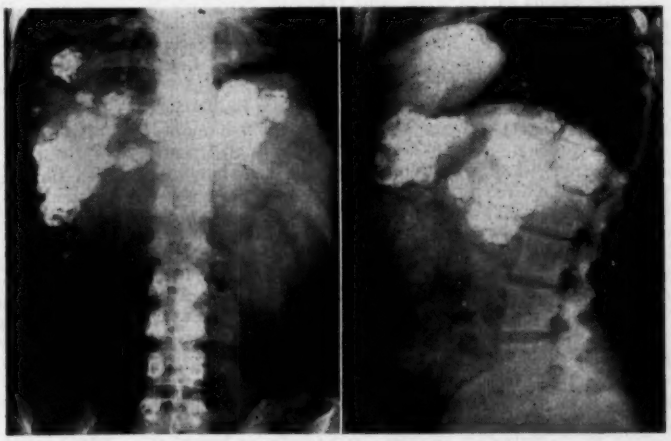
THE finding of widespread calcification within the liver appears sufficiently unusual to warrant a short description of a case and a discussion of its probable ætiology.

Case-report

A housewife, aged 47, was referred to hospital in June, 1953, because of severe high epigastric pain. This had occurred first in April, 1952, and, after lasting a month, remitted until April, 1953, after which it recurred and persisted. The pain, though largely epigastric, occasionally radiated to the interscapular region of the back. It lasted several hours each day and was not precipitated or relieved by food or by any activity. Appetite was stated to be unimpaired, but the patient had lost 1–1½ stone in weight.



a *b*

Calcification in Liver: *a*, postero-anterior view; *b*, lateral view.

Examination.—She was a woman of average physical development, nutrition, and intelligence. Her mucosæ were well coloured. Her liver was enlarged, extending 2 inches below the right costal margin at the level of the ninth costal cartilage; it was extremely hard and slightly tender, and had a grossly irregular surface. Her spleen was not enlarged. Clinical examination was otherwise negative.

Past Medical History.—At about the age of 13 she had been admitted to "a hospital in Belfast" with a "tumour of the liver." She had been treated with weekly injections, which (she indicated) were made in the antecubital fossa and were presumably given intravenously. After receiving six injections she defaulted. Attempts to trace these hospital records have been unsuccessful. She had not resided outside the British Isles or had any dysentery.

Family History.—She has never known her father. Her mother died aged 84, cause unknown; a brother died aged 32 with tuberculous arthritis; another brother, aged 56, and a sister, aged 50, are believed to be alive and well. They live abroad and have not been traced in connection with the present investigation. The patient has six children, of whom five are apparently healthy and the sixth is a mongol. She denies any miscarriages.

Investigation.—Straight radiography of the upper abdomen revealed widespread calcification within and limited to the liver. This consisted of a large central irregularly spheroidal mass surrounded by small irregularly calcified areas scattered throughout both lobes (see figure). Cholecystography showed a somewhat enlarged gall-gladder which filled well. Barium-meal follow-through X-ray examination of the alimentary tract was negative. The erythrocyte-sedimentation rate was 2 mm. in one hour (Westergren). Liver-function tests and prothrombin level were normal. Casoni test for hydatid disease negative. Hydatid complement-fixation test negative. Mantoux test (1 : 10,000) positive. Blood Wassermann reaction faintly positive ± —. Kahn reaction positive on two examinations.

Progress.—In view of the past medical history and the results of serological tests a provisional diagnosis of calcification of a gumma or gummata of the liver was made and treatment with penicillin was started. In twelve months the patient received three courses of penicillin each of 5 mega-units in ten or twelve doses, and two and a half courses of bismuth each of 1·6 g. in eight doses. During that time she had very little pain, and afterwards the liver appeared somewhat smaller on palpation though still very hard and a little tender. Liver-function tests remained normal. The blood Wassermann reaction was very faintly positive ± —.

Discussion

It is recognised that calcification may develop in parasitic, neoplastic, infective, granulomatous, and

vascular lesions of the liver, and that the condition is rare. Konzelmann (1946) reports an incidence of 1 in 8000 necropsies. The differential diagnosis of these various forms of calcification is discussed by Bassler and Peters (1947) and Astley and Harrison (1949).

Heilbrun and Klein (1946) conclude that, in cases such as these, hydatid disease is probably the commonest underlying lesion, and they report the case of a Czech serviceman, aged 32, whose complaint of vague abdominal pain led to the discovery of an irregular massive calcification in the liver. They postulate the presence of alveolar echinococcosis, in which disease the daughter cysts evaginate from the germinal epithelium and migrate throughout the liver substance. They point out that death and calcification of that lesion would explain the radiological findings in their patient. However, they mention that the serological test for syphilis was persistently positive, although there was no other evidence of that disease.

Except for the difference of age and sex our patient is strikingly similar to that of Heilbrun and Klein (1946); indeed the radiological appearances are almost identical. Both patients gave serological tests suggestive of syphilis, but except for liver disease they appeared quite healthy. In our patient the past history of "tumour of the liver" diagnosed at the age of 13 and treated by injections, probably intravenous, suggests that syphilis was diagnosed at that time, and that any such infection was probably congenital. However, there are at present no other manifestations of congenital syphilis, the family history does not support the diagnosis, and the liver calification now present does not show the trabecular configuration described by Gray (1944) as characteristic of calcification in gummata. Alveolar echinococcosis, which was at one time believed to be restricted to certain areas of the European mainland, has recently been reported in Britain (Walshe 1954). Further, the occurrence of infestation before the age of 13 is no bar to the diagnosis, since the "hydatid cyst is nearly as old as its host" (Dévé 1933 quoted by Latham 1953). The occurrence of false positive serological reactions for syphilis in chronic liver disease is generally recognised and ascribed to abnormal globulin. In our patient there was no biochemical or hæmatological evidence of liver dysfunction. Also we have been unable to trace reports of false positive reactions in hydatid disease.

We cannot exclude calcification in hepatic tuberculoma in our case. Gray (1944) suggests that such lesions appear radiologically as dense spheres surrounded by clear moats, and that usually there is evidence of tuberculosis elsewhere, particularly in the spleen.

Although we favour the view that in our patient the underlying lesion is gummatous, this must at present remain speculation. Biopsy of the liver at this stage is considered unlikely to provide histological proof of the nature of the calcified lesion. The case is reported because of its rarity and in the hope that its similarity to other cases of liver calcification may lead to a recognition of its underlying pathology.

We are indebted to Mr. J. G. Williamson for the reproduction of radiographs.

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Preliminary Communication

PHAGE-TYPES OF STAPHYLOCOCCUS PYOGENES ISOLATED FROM IMPETIGO AND SYCOSIS BARBÆ

DURING twelve months June, 1954, to July, 1955, swabs from lesions of patients attending this hospital with impetigo and sycosis barbæ were examined with particular reference to the isolation of *Staphylococcus pyogenes*. Strains isolated were phage-typed by the method of Williams and Rippon [1] and their sensitivity to penicillin was determined by the serial-dilution tube method using the medium described by May et al.[2] The Oxford staphylococcus was used as the reference organism.

51 strains, of which 34 (67%) were isolated from impetigo lesions and 17 (33%) from sycosis-barbæ lesions, were examined in this way.

45 strains (88%) were lysed by one or more of the 20 basic phages, used at their routine-test dilution.

Of the 34 impetigo strains 31 (91%) were typable, 25 (81%) being lysed by phage 71 alone, while 1 strain gave the pattern 55/71. Of the 14 (82%) typable strains from 17 sycosis-barbæ lesions only 2 (14%) were lysed by phage 71 alone, 1 other strain giving the pattern 79/42D/71.

Group distribution in this series was:

Group I	9%
Group II	61%
Group III	24%
Mixed	4%

This distribution of the majority of *Staph. pyogenes* from skin lesions into groups II and III confirms the findings of Tulloch,[3] whose results showed the same general distribution; but his series did not include any strains isolated from impetigo lesions, and consequently the percentage of group-II strains was smaller (20% against 61%) and of group-III strains greater (46% against 24%) than in the present series.

Only 17 (38%) of the 45 typable strains were sensitive to penicillin. 8 (26%) of the 31 impetigo strains typable were sensitive, compared with 9 (64%) of the strains derived from sycosis barbæ.

Work is now in progress to determine whether the strains of staphylococci lysed by phage 71 alone have characteristics which would explain their predominance in impetigo.

I wish to thank the Medical staff of the Rupert Hallam Department of Dermatology for their kindness and coöperation during this investigation.

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"... The shortage of staff in the office seems, though it cannot be proved, to be even worse than it is in the factory. It is certainly even more novel. ... There is, it goes without saying, shortage everywhere, in clerical and in manual work alike. That is the symptom of inflation, over-consumption or over-employment—call it what we will. It is often argued that clerical wages have risen considerably less than manual wages since before the war and that this shows that the office worker is underpaid and should be paid more. The premise is right; the deduction less certain. A long-term change seems to be at work. In the days when real command of the 'Three R's' still belonged to a minority, capacity for routine clerical work was worth a premium. But the extension of general education has made that capacity universal. The rarer and more sought-after qualities now are those of physical quickness and strength, coördination of mind and muscle, and willingness to work under hard conditions."—*The Times*, Aug. 12, 1955, p. 9.

Reviews of Books

Bone

An Introduction to the Physiology of Skeletal Tissue. FRANKLIN C. MCLEAN, M.D., professor emeritus of pathological physiology, University of Chicago; MARSHALL R. URIST, M.D., associate clinical professor of surgery (orthopedics), University of California. Chicago: University of Chicago. London: Cambridge University Press. 1955. Pp. 182. 45*s*.

THIS is the first of a new series of publications, "The Scientists' Library: Biology and Medicine." Dr. Peter P. H. De Bruyn, the general editor, explains in his preface that the series is intended

> "to provide authoritative information about the growth and status of various subjects in such a fashion that the individual books may be read with profit not only by the specialist but also by those whose interests lie in other fields. . . . The authors have been asked to assume a common level of scientific competence, rather than to attempt popularization of the subject matter."

Dr. McLean and Dr. Urist have largely fulfilled these aims, but they have not erred on the side of popularisation. The illustrations are not abundant, and the "common level of scientific competence" has to include a fair knowledge of mammalian histology if the reader is to follow some of the chapters.

Many of the new technical methods now used in biology and medicine have been brought to bear on the problems of bone, and 14 consecutive chapters describe contributions from morphology, crystallography, electron microscopy, isotope studies, and so forth. Each chapter is intended to stand by itself, though they follow in more or less logical sequence, starting with the histology of bone, and each reviews briefly and critically one aspect of the morphology or physiology of bone. As the title indicates, the book is mainly concerned with normal bone, but some pathological changes are discussed in the last two chapters, and the one on fracture healing is based mainly on the authors' own work.

The authors are naturally biased by their own studies and predilections, but on the whole they offer a balanced and critical assessment of the more important work, including papers published as recently as 1954. Their point of view is clear, even though, on many points, it emphasises, rightly enough, our ignorance rather than our knowledge. As techniques become more complex, each worker finds it harder and harder to keep level with, and assess the significance of, the results obtained by his neighbours. The morphologist, for instance, has difficulty in assessing the significance of the results of experiments with radioactive isotopes, and the chemist may produce impossible theories on bone physiology if he is ignorant of the cellular mechanism involved in the absorption and deposition of bone. By their well-balanced and succinct account of much of the recent research on bone, Dr. McLean and Dr. Urist will help to lower the partitions between compartments. But the price of their monograph, considering its small size and the limited number of illustrations, seems high.

The Mental Hospital

A Study of Institutional Participation in the Treatment of Psychiatric Illness. ALFRED H. STANTON, M.D.; MORRIS S. SCHWARTZ, PH.D. London: Tavistock Publications. 1955. Pp. 492. 35*s*.

THIS book by a psycho-analyst and a sociologist in America will do much to meet the growing interest in the social organisation of our mental hospitals. Dr. Stanton and Dr. Schwartz describe the social interaction in a disturbed ward where fifteen female patients, mostly schizophrenics, were cared for by about the same number of nurses. Formal treatment was largely confined to a daily psycho-analytic interview; but the purpose of their study, which covered two years, was to examine the events of the other 23 hours of the day. In a painstaking and fascinating way they try to piece together the meaning of the patient's behaviour as seen through the eyes of the patient himself, of the other patients, and of members of the therapeutic and administrative staff. A study of this kind presents enormous technical difficulties, but these are faithfully reported, and it is to the credit of the staff and administration at Chestnut Lodge, a small private mental hospital near Washington, D.C., that they have agreed to the publication of such a revealing story of staff-patient interaction. Perhaps the most important principle which emerges is that it can no longer be maintained that therapy is confined to the treatment session with the doctor. The interaction between the patient and other members of the hospital community, both patients and staff, is just as important. How to develop such social interaction so that it aids rather than hinders the patient's progress is the main concern of this book. The reader cannot fail to gain more understanding of what psychiatric practice looks like to the patient, and must see what powerful therapeutic weapons lie too often unused. The principles outlined should infuse a new interest into mental-hospital psychiatry, and, if successfully applied, might incidentally do much to decrease the shortage of nurses.

Physicians' Office Attendants Manual

HENRY B. GOTTEN, M.D., associate professor of medicine, University of Tennessee; DOUGLAS H. SPRUNT, M.D., professor of pathology, University of Tennessee, Springfield, Ill.: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1955. Pp. 91. 27*s*. 6*d*.

As its title suggests, this book has been written for the lay assistant who helps the doctor to run his practice. The background is medical practice in the United States, and while much of its content is universal much would be strange to British usage.

The section on office work describes the duties and responsibilities of the secretary-receptionist which include a number of tasks reserved in this country for a trained nurse. The subjects covered range from office procedure to professional ethics, and on the practical side there are illustrated instructions for the preparation of trays for examination. The second half of the book describes laboratory procedures. Over here some of these would be undertaken in a ward side-room, and most of them by a laboratory technician. In the few general practices in this country where laboratory work of this kind is done, red and white cell-counts, for example, would probably be made by the doctor himself and not by a lay technician.

Industrial Dust

2nd ed. PHILIP DRINKER, S.B., CH.E., professor of industrial hygiene, Harvard School of Public Health; THEODORE HATCH, B.S., S.M., professor of industrial health engineering, Graduate School of Public Health, University of Pittsburgh, and research adviser, Industrial Hygiene Foundation, Mellon Institute. New York and London: McGraw-Hill. 1954. Pp. 401. 71*s*. 6*d*.

SINCE its publication in 1936 "Drinker and Hatch" has been a standard textbook on the engineering aspects of industrial dust. The second edition will be welcomed in this country, both by engineers and by doctors interested in industrial health; for it bears the stamp of authority and is carefully written and produced. Perhaps its most noteworthy feature is the common sense which keeps breaking through the presentation of complex scientific facts.

In their preface the authors say that "control of the dust hazard in industry is the joint duty of the physician and the engineer" and they emphasise the coöperative nature of the problem by pointing out that, though the design of dust-control apparatus is an engineering matter, it is often the physician who finally appraises the success of the control system. Not all doctors have the background to appreciate the "sweet simplicity" of the numerous mathematical formulæ used by Professor Drinker and Professor Hatch to illustrate their engineering points, but they will undoubtedly benefit from the full and learned discussions of the effects of dusts and fumes on man; the inert and toxic dusts; the dusty trades; dust retention by man; and physical and chemical factors in pneumoconiosis.

A doctor interested in industrial medicine should know about methods of ventilation, how to take and analyse a dust sample, and why dust respirators are regarded

as only a second line of defence. At the present time, too, when pollution of the atmosphere is so much "in the air," this is an essential book because it contains most of the known facts about dusts and fumes.

Klinische Zytologie der Thoraxkrankheiten

HEINZ GRUNZE, senior physician, Landes-Tuberkulose-krankenhaus Heckeshorn, Berlin-Wannsee. Stuttgart: Ferdinand Enke. 1955. Pp. 190. DM. 59.

Dr. Grunze does not deal only with the cytology of sputum and pleural exudates: he also describes techniques for obtaining, by needle biopsy, material for examination from the soft tissue and bones of the thorax, from mediastinal and peripheral pulmonary lesions, and from enlarged hilar glands. He demonstrates the necessity for studying cytological appearances in health as well as disease, and carefully considers the difficulties of distinguishing malignant cells from those originating in chronically inflamed tissue. Staining methods in common use are described, and their relative advantages and drawbacks assessed. The 154 illustrations, 56 coloured, are on the whole of high quality. This work embodies the fruits of much practical experience, and there is an ample bibliography. It is very useful to have such comprehensive information on this subject in a single volume.

Hematology (2nd ed. Springfield, Ill.: Charles C. Thomas-Oxford: Blackwell Scientific Publications. 1955. Pp. 1222. £7).—In its second edition this textbook by Prof. Cyrus C. Sturgis, of Michigan, retains the advantages of having an author who draws freely on his own experience; and it is also distinctive in giving enough space to historical aspects of its subject. Comparison with the first edition shows that every page has been scrutinised and many revisions have been made, along with suitable deletions. There is, for example, a really useful and wise discussion of the causes and management of anæmias secondary to other diseases, and the section on the treatment of anæmias in general can hardly be improved on. The section on leukæmias is also notably realistic and up to date. In these sections British contributions are well noticed. Some other sections, though good, are not up to this high standard. Hæmorrhagic diseases are somewhat confusingly handled, and a discussion on "does Hæmophilia ever occur in the female?" ignores the British work that settled this question in the affirmative four years ago. Also the use of the term "malignant lymphomas" for what most other people call "reticuloses" may cause difficulty. And the illustrations are still not particularly good. But on the whole this volume remains one of the most readable and informative textbooks of hæmatology available, and it ought to be on the desk of the clinician ready for use when he has a little spare time. Unfortunately the notably high price is likely to keep it on the library shelf.

New Inventions

CARDIOPHONY OF THE EXPOSED HEART

WHEN operating upon the heart I have found the need for something better than the usual sterilised stethoscope for placing over the desired areas of the pericardium or myocardium before and after intracardiac manœuvres. Since I was trained as a surgeon and not as a cardiologist, I have often wanted a colleague to hear what I could hear and advise me.

For these reasons a microphone (fig. 1) has been devised which is extremely small, can be readily placed on the heart itself or slipped inside the pericardium and is capable of being sterilised. It is connected to an amplifier (fig. 2) which reproduces the sounds on a loud-speaker. The actual design of the microphone and electrical circuit has presented some unusual problems, but these have been solved. The main difficulty was to cut down extraneous noises but retain sensitivity over a wide range. Amplification gives a 15-watt output free from distortion over a wide frequency range of 20 to 20,000 cycles per second. The machine ('Metron S.A.3')* has been designed by Mr. Lionel Fothergill, to whom I owe much for his great skill and even greater patience in incorporating modifications as they became necessary.

The general principle has been to reduce all controls to a minimum, and the apparatus can be switched on and adjusted rather more easily than the modern radio set. It is of rugged construction and measures only 21 × 13 × 9 in. over-all. The microphone can be sterilised in most antiseptic fluids or formalin vapour, and can also be produced in various shapes. The one illustrated has proved the most valuable, the little rubber patch on its upper surface forming a convenient finger-rest when applying it to areas not under direct vision. It has, however, been made in many other shapes, one of which can be slipped inside the chambers of the heart.

The instrument has a built-in loud-speaker; but, if other kinds of record are required, outlets are provided for a tape-recorder or a writing instrument.

It has been found very instructive to be able to hear the sounds picked up directly over healthy and diseased valves and especially before and after mitral and pulmonary valvotomy. It is of course most useful for demonstrating these sounds to students. If necessary the instrument can be used in the ward for teaching purposes, when a different type of microphone is placed on the chest wall.

It must not be forgotten that clinical auscultation with the ordinary stethoscope is an art which takes a long time to acquire, and likewise a certain amount of practice is necessary before one becomes accustomed to using this cardiophone. The human ear discriminates in its own way, and its sensitivity is much greater in the higher-frequency range, although the low tones (if equally magnified) will mask the higher ones. The two frequency-range controls allow one to compensate for this.

This apparatus is a useful adjunct to cardiac surgery enabling cardiologist and surgeon to coöperate in the operating-theatre and at the same time making it possible to demonstrate heart sounds clearly to students.

SELWYN TAYLOR
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Surgeon to King's College Hospital and to the Postgraduate Medical School of London

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Fig. 1.

Fig. 2.

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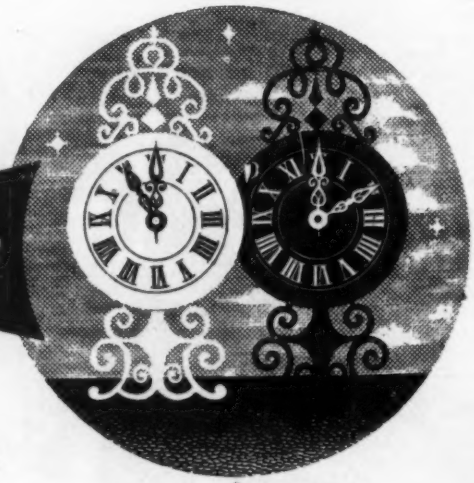

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THE LANCET
LONDON: SATURDAY, AUGUST 20, 1955

Management of Chronic Gout

DURING the past five years a more hopeful attitude has emerged towards the management of chronic gout, and this is reflected in the title of the article by Dr. MARSON which we publish this week—Complete Relief of Gout—and in a recent paper by BARTELS [1] (Gout—Now Amenable to Control). It is clear that the continuous administration of uricosuric agents can, in most cases, reduce the size of tophi, reverse the radiographic abnormalities, and eventually control acute attacks. Apart from the choice of uricosuric drug, the clinician must decide at what point in the course of the disease this treatment should be started and how long it should be continued. Sodium salicylate and probenecid ('Benemid') are at present the main alternatives, and the choice between them must rest on their relative efficiency, the frequency with which they produce undesirable effects, and their cost. SOUGIN-MIBASHAN and HORWITZ [2] have lately added ethyl biscoumacetate ('Tromexan') to the list of uricosuric agents—an observation of considerable theoretical interest but hardly likely to influence practical therapeutics. BARTELS [1] dismisses salicylate summarily (and, it seems, unjustifiably) as not active enough to restore the serum uric-acid level to normal except in early or mild gout, or when the uric-acid level is only slightly raised. MARSON, on the other hand, by giving salicylate, in daily doses of about gr. 90, has been able to maintain the serum uric-acid at a lower level than was possible with 2·0 g. daily of probenecid [3]; and he has produced impressive evidence that salicylate treatment favourably influences the course of the disease.[4] With both methods the lowest serum uric-acid levels were reached during the first few days of treatment, and subsequent values tended to be higher. Reports [5 6] of antagonism between the two drugs when given together were not confirmed, but there was nothing to be gained from using them in combination.[3] In one of MARSON's cases acetylsalicylic acid seemed as effective as sodium salicylate, and the former certainly merits consideration as a more convenient preparation.

In the matter of toxic effects MARSON's impression of probenecid seems to have been less favourable than that of other workers: of 15 patients treated 2 had severe hypersensitivity reactions, 6 had gastro-intestinal symptoms (but not bad enough to stop treatment), and 1 had unexplained pain in the loin.[3] BOGER and STRICKLAND [7] have studied the incidence of toxic effects in 2502 patients treated with probenecid by themselves and others. The most important of these were gastro-intestinal symptoms (in 3·1%), rashes (1·3%), and reactions of hypersensitivity (0·3%). One group of incidents during treatment was an inevitable result of uric-acid diuresis rather than a toxic effect. Such incidents included costo-vertebral pain, renal colic, and hæmaturia—all attributable to the precipitation of urate crystals in the urinary tract. BOGER and STRICKLAND advise scrupulous care in making sure that the urine is alkaline during the early weeks of treatment. No deaths have been attributed to treatment with probenecid and there has been no reason to suspect any chronic toxicity. It has been common to get more acute attacks during the initial stages of treatment with probenecid; colchicine (or, perhaps, phenylbutazone) can be given to relieve or prevent these. The common toxic effects of salicylate are conspicuous with the large doses required, but MARSON is apparently able to induce most of his patients to accept these, and he finds that the symptoms become less troublesome in time. On the score of cost salicylate wins handsomely: a week's treatment of a hospital patient with probenecid (2·0 g. daily) costs 13*s.*; for sodium salicylate (gr. 90 daily, in a flavoured mixture) the figure is 1*s.* 9*d.*

A sound theoretical case could be made for starting a uricosuric drug as soon as the diagnosis of gout is firmly established and for continuing it for the remainder of the patient's life. It is impossible to be certain of the point at which deposits of urate first appear in the tissues and initiate the irreversible changes which may lead in the end to permanently damaged joints and perhaps kidneys. On the other hand, many will know of patients who have had years of freedom after a single acute attack of gout—it was as many as 62 years in a case described by BAUER.[8] To start lifelong treatment (especially with high doses of salicylate) after a single attack of gout would demand a singularly firm physician and a particularly amenable patient. But there can be little doubt that frequently recurring attacks of gout, incomplete resolution of arthropathy between attacks, radiographic changes in bones, and tophi in the soft tissues are firm indications for starting treatment with probenecid or salicylate. It is rational that treatment should be continuous but almost certainly unnecessary to supplement it with any close restriction of diet. And it is important to bear in mind that treatment must be continued for many months before benefit can be expected.

This notable advance in treatment has thrown little fresh light on the mechanism whereby a chronic familial defect of metabolism is punctuated by explosive episodes of acute gout. Certainly such attacks can continue after the uric-acid level in the serum has been lowered by treatment to well within the normal range. This strengthens the evidence that uric acid itself is not responsible for acute attacks, and it has suggested to MASON [9] that a precursor of uric acid may be involved, the formation of which may be blocked by colchicine. He points out that such a precursor must be abnormal, for colchicine has no effect on the concentration of uric acid in the blood. From experiments with isotopic glycine

1. Bartels, E. C. *Ann. intern. Med.* 1955, **42**, 1.
2. Sougin-Mibashan, R., Horwitz, M. *Lancet*, 1955, **i**, 1191.
3. Marson, F. G. W. *Ann. rheum. Dis.* 1954, **13**, 233.
4. Marson, F. G. W. *Quart. J. Med.* 1953, **22**, 331.
5. Pascale, L. R., Dubin, A., Hoffman, W. S. *J. Amer. med. Ass.* 1952, **149**, 1188.
6. Gutman, A. B., Yü, T. F. *Amer. J. med.* 1952, **13**, 744.
7. Boger, W. P., Strickland, S. C. *Arch. intern. Med.* 1955, **95**, 83.
8. Bauer, W. *New Engl. J. Med.* 1943, **229**, 583.
9. Mason, R. W. *Ann. rheum. Dis.* 1954, **13**, 120.

BENEDICT et al.[10] concluded that in gouty subjects there may be a more rapid mechanism for transforming glycine into uric acid than is normally the case, and they suggested that this transformation may be accomplished by a different metabolic route.

Research on Human Nutrition

IN the 19th century, nutritional research was concentrated on energy requirements and the interrelations of the three basic foodstuffs—proteins, fats, and carbohydrates. In the first half of the 20th century the predominant interest was in the vitamins. After their discovery by HOPKINS and FUNK, knowledge of their properties accumulated rapidly, and consequently we now know enough to prevent the five major vitamin-deficiency diseases—beriberi, pellagra, scurvy, rickets, and keratomalacia. That these five diseases can still be seen here on occasion, and remain prevalent in some other parts of the world, is due to the great difficulty of applying new nutritional knowledge and in particular the need for more instruction on the subject. Today, in the second half of the 20th century, the principal problems in human nutrition about which the general public, the clinician, and the research-worker would all like more information include: (1) the relation of dietary habits to degenerative processes of ageing, and particularly to atheroma and the growth-rates of tumours; (2) the effects on health of the manifold chemical and physical treatments involved in the processing of all the common foods, which is inevitable in an industrial community; (3) the effects of various foods and dietary habits on the efficiency and working capacity of the industrial population; (4) the effects of diet on resistance to infectious disease, especially the common respiratory infections; and (5) the constitution of the diets most favourable to human growth and development at all stages from prenatal life to adolescence. The importance of this last problem was emphasised in the latest annual report of the Medical Research Council,[11] in which a section on the investigation of human nutrition is almost wholly devoted to kwashiorkor and the supply of suitable proteins for the young. In most of Africa, and in some other countries, probably nothing else is so important for the improvement of health.

A research nutritionist, if asked to tackle any of these problems, might well reply that this would be easy provided he had a suitable supply of volunteers, prepared to live on controlled diets for months or years. He might add that if he was expected to rely on the excellent equipment for housing and feeding small rodents, which he had inherited from his predecessors of the "vitamin era," he would have little hope of doing much towards their solution. In fact he can contribute new knowledge only by careful field observations, when circumstances permit, and by seizing the rare opportunity that may arise for a controlled experiment. Nevertheless, valuable contributions have been made in the last decade, including the field studies of SMITH and WOODRUFF[12] in a Japanese prisoner-of-war camp, of the Cambridge school of experimental medicine in Western Germany,[13] and of BROCK and AUTRET[14] and others in Africa. A good example of a careful attempt to correlate diet with morbidity and mortality is the study by KEYS and his colleagues[15] of the association between the incidence of coronary-artery disease and a high national consumption of fats in many countries. Controlled experiments, however, have been few and far between. The most comprehensive has been the Minnesota experiment[16] on human starvation, but chances of tests on such a scale rarely arise, though groups of volunteers have been collected among conscientious objectors in war-time. WIDDOWSON and MCCANCE'S[17] controlled trial of the nutritive value of breads made from various flours, carried out in orphanages in post-war Germany, were excellent attempts to elucidate a most difficult problem; but, as we pointed out the other day,[18] their results are none too easy to interpret and certainly give no clear-cut guidance to those responsible for the regulation of milling processes.

This week we publish a paper, by Professor BROCK and his colleagues from three centres in South Africa, on the treatment of kwashiorkor. For the last five years there has been no doubt that dry skimmed-milk powder is an effective remedy for kwashiorkor; but skimmed milk is a complex chemical mixture, and the nature of the active therapeutic agent has been uncertain. In this latest work a good series of controlled trials have shown that casein is the factor that initiates the cure, and in this respect its action has proved to be independent of the addition of a general vitamin mixture. A few further trials have indicated that an amino-acid mixture alone can be equally effective in causing immediate improvement in children with kwashiorkor. These findings will be valuable to physicians responsible for the treatment of the many cases of kwashiorkor in Africa, but they should be still more useful in planning preventive measures. Milk is certainly an excellent prophylactic against the disease; but in Africa, as in many other places, it is impracticable to wait and hope for the development of dairy-herds capable of supplying the needs of the children, especially in their critical second year. When we can define accurately in chemical terms the property of the substance or substances in the milk that is so critical for child development, then it should become possible to find alternative sources, perhaps from vegetable products, and to plan agriculture so as to enable prophylaxis to be carried out on the scale required. The investigations of BROCK and his colleagues are a promising start in the task of finding out what the critical chemical agents are. Their trials have been on a large scale in three separate cities. Good central organisation and a sufficiency of skilled staff—chemists, doctors, and nurses—have been the factors responsible for the success already achieved.

Opportunity to elucidate the nutritional problems of our day is not easily found; and we must hope

10. Benedict, J. D., Roche, M., Yü, T. F., Bien, E. J., Gutman, A. B., Stetten, DeW. jun. *Metabolism*, 1952, **1**, 3.
11. Report of the Medical Research Council for the year 1953–54. H.M. Stationery Office.
12. Smith, D. A., Woodruff, M. F. A. *Spec. Rep. Ser. med. Res. Coun., Lond.* no. 274, 1951.
13. Members of the Department of Experimental Medicine, Cambridge. *Spec. Rep. Ser. med. Res. Coun., Lond.* no. 275, 1951. See *Lancet*, 1951, ii, 390.
14. Brock, J. F., Autret, M. F.A.O. Nutritional Studies no. 8. Rome, 1952. See *Lancet*, 1952, ii, 1070.
15. Keys, A. *Circulation*, 1952, **5**, 115.
16. Keys, A., Brozek, J., Henschel, A., Michelsen, O., Taylor, H. L. Biology of Human Starvation. Minneapolis, 1950. See *Lancet*, 1951, i, 95.
17. Widdowson, E. M., McCance, R. A. *Spec. Rep. Ser. med. Res. Coun., Lond.* no. 287, 1954. See *Lancet*, 1954, ii, 1006.
18. See *Lancet*, July 30, 1955, p. 235.

all the more that those who control grants will appreciate the necessity for financial assistance and staff on a liberal scale and that they will not expect results to be produced rapidly. In this country, we are indeed fortunate in that the Medical Research Council has already done so much to support basic research on human nutrition.

Annotations

PLOUGHSHARES AT GENEVA

THE International Conference on the Peaceful Uses of Atomic Energy, organised by the United Nations at Geneva, is now drawing to a close after nearly two weeks' deliberation in which about a thousand scientific papers have been read or tabled. For the first time a good deal about the design of nuclear reactors and atomic power stations has been made public, and the machinery used in this work offered for international sale. Economically and industrially atomic energy has become important for national prestige, and it seems that at present Britain leads in the export of radio-isotopes. Part of the interest of the conference was to learn what Russia, the United States, and Canada were offering.

Some of the medical papers, naturally enough, were on the health risks of radioactivity, which is where radiotherapy, genetics, and physics join hands. Others dealt with the biochemical and physiological results of using radio-isotopes in the investigation of intermediary metabolism, usually mammalian: a very great deal has already been published on such subjects as diabetes, the synthesis of hæmoglobin, and the metabolism of steroid hormones and proteins. In a third group of papers atomic energy was applied in medical practice—for example, to the detection of cerebral tumours, the invention of a highly portable X-ray apparatus requiring no electricity, the examination of thyroid activity, the spread of communicable diseases in the field—a miscellaneous and ingenious group of fruitful applications. It is evident that many clinicians can hardly be aware of the enormous quantity of work that has been done, and mostly published, in the past ten years. Some of it is ready to affect clinical practice and research, but it is difficult for the medical worker to know what opportunities atomic energy offers him, not because of any secrecy but because of the specialised language and specialist journals in which the work often appears. There is a need for simple reviews which explain the situation to the non-physicist, and perhaps for some kind of medical advisory service like that already offered to industry.

At Geneva Dr. E. E. Pochin gave an excellent brief review of iodine metabolism. For examination of thyroid function he recommended a simple test in which an inoffensively small dose of radioactive iodide is injected, and two hours later the degree of absorption by the thyroid is estimated by a five-minute count at the patient's neck and thigh. Normally the kidney clears the plasma of iodide at the rate of 2 litres per hour, while the thyroid works at only 1 litre per hour; but the thyrotoxic thyroid clears at 15 litres per hour. The normal human thyroid (unlike that of rat and rabbit) discharges its iodine slowly, over six weeks or more. But the thyrotoxic gland discharges quickly (about four days), and so does carcinomatous thyroid, which has a poor uptake, however. A similar method for assay of thyroid function is in use in the U.S.S.R., according to Dr. M. N. Fateyeva; but in Russia the chief interest has been to study thyroid activity in non-thyroid diseases. For instance, increased thyroid activity has been noted in stage-I essential hypertension, in 50% of patients with rheumatic carditis at the height of the disease, and in acromegaly. The test is useful in the differential diagnosis of anxiety state from thyrotoxicosis, since function remains normal in the neurosis. Canadian workers advocated the measurement of radio-iodine in the saliva twenty-four hours after a test dose as a good guide to thyroid function.

Urinary excretion of creatine in considerable amounts is one of the laboratory signs of thyrotoxicosis. Dr. DeWitt Stetten, jun., explained that creatine is normally made in the liver and taken up by the muscles, where as creatine phosphate it takes part in muscular contraction. A fraction of it is converted there to creatinine and excreted constantly in the urine. Using isotope methods it has been possible to show that the creatinuria of thyrotoxicosis is due to overproduction by the liver under thyroid stimulation. In muscular dystrophies, on the other hand, liver production is normal but the diseased muscle does not take up its creatine ration, which consequently appears in the urine. In another illustration of isotope work Prof. A. B. Hastings described results in diabetic rats partly confirmed for human diabetics, which show that in diabetes there is both an inability of muscles to use glucose and an overproduction of glucose by the liver, which contains twice the normal amount of the enzyme glucose-6-phosphatase. When insulin is given, the muscle failure is corrected almost at once whereas the liver abnormality takes some hours to put right.

In an equally interesting report, Dr. Dale W. Jenkins described the labelling of mosquitoes and flies to determine their spread from a release point, their life-span, their predators (which also become radioactive), and the total natural population (by dilution). In the same way, many viruses and bacteria can be made radioactive, and their survival in and dissemination by their hosts followed. And in man erythrocytes can be labelled by contact with sodium chromate (Cr^{51}), and serum-albumin with radioactive iodine, as Prof. W. V. Mayneord mentioned in a useful review of other isotope methods. He described how xenon 133 can be adsorbed on carbon and used to take radiographs without any source of electricity or large apparatus: a radiograph of the ankle needed a ten-second exposure. Professor Mayneord also referred to the use of radioactive isotopes selectively absorbed by cerebral tumours, as did Dr. G. L. Brownell and Dr. W. H. Sweet, who have devised an ingenious way of displaying the tumours without opening the skull. They inject arsenic 74 intravenously, and this concentrates about ten times more in tumour tissue than in normal cerebrum.

The many papers on the health effects of radiation combined to emphasise the impossibility of being sure that so-called safe exposure limits are neither too high nor too low. Dr. D. E. Clark reported 15 cases of carcinoma of thyroid in children under 16, all of whom had at some time had X-ray treatment for benign conditions of the head, neck, or chest. Dr. R. J. Hasterlik and Dr. L. D. Marinelli described 4 patients who got neutron and gamma-ray overdoses from an accident at work. None of them had symptoms of radiation sickness, and only 1 showed a (transient) skin erythema. Hæmatological investigation did not show a great deal either, but there was a high and abnormal urinary amino-acid excretion within twelve hours of exposure and this continued for five months; and sperm counts on the men showed diminution or aspermia maximal at the tenth month, with subsequent recovery. As for genetic effects produced by the increased rate of mutation, we really know nothing good or ill. As Dr. J. F. Loutit said, "New mutations are merely repetitions of the old which Nature has tried before. When the environment changes, a mutation once deleterious may in fact be favourable."

SKELETAL MATURITY

THE degree of maturity of the skeleton is of interest occasionally to the clinician and constantly to those investigating growth and development. Such workers are increasingly aware of the shortcomings of present methods, which are four in number:

(1) Comparison of radiographs of the hand and wrist with standard films typical of different ages. An "atlas" of such films was published as long ago as 1902 by Wilms.[1]

(2) Measurement of the size of the bone images on a radiograph.[2–5] This method is little used because it is inaccurate and time-consuming.

(3) Radiography of all the joints on one side of the body, counting the ossified centres.[6 7] This is expensive and is impracticable as a routine procedure.

(4) A method, based on (1), in which the equilibrium of bone maturation is determined by recording the individual range in various bones. This is known as the red graph method.[8] It is complex and does not take into consideration structural changes in epiphyses.

Investigations by these methods have yielded one vital piece of information: there are sometimes considerable differences between the stage of maturation of different areas of the body. Maresh [9] has shown that the long bones do not all grow at the same rates, nor fully mature at the same end-point. The cause of these differences is not clear.

Today the inspectional technique is most commonly used. It is based on the fundamental work of Todd,[10] who published an atlas and standard of reference in 1937 after discussions with Hellman [11] and Flory.[12] Todd described the exact image changes in the radiographs of the growing ends of long bones. His publication concerned the hand and wrist, but he prepared excellent unpublished descriptions and standards for the elbow, shoulder, hip, knee, and foot. In 1950 Greulich and Pyle [13] revised the atlas and added descriptions of the maturing round bones of the carpus. This atlas is at present the standard work of reference. In addition there is an atlas of standards of Dutch children by Speijer,[14] and a report by Mackay,[15] relating to East African children, which reveals another difficulty—the part played by racial, nutritional, and other influences.

Acheson[16] has pointed to the shortcomings of the inspectional technique. These are:

(*a*) A fixed pattern of first appearance and subsequent development of centres is presupposed. The *order* in which certain centres appear is known normally to vary widely, and thus comparison of films with the standards is difficult and a large subjective error inevitable.

(*b*) The time interval between the standard films is too long. Coarse grouping is an essential of the method, but this introduces further subjective errors.

(*c*) Two sets of standard films are needed since the two sexes mature at different rates.

(*d*) Acheson points out that bone cannot *decrease* in size during growth; so, he argues, skeletal maturity should not be measured with time as a yardstick, but should have units of its own.

Acheson writes: "To speak of the mean skeletal maturity status of a group of children aged 2½ years as 'skeletal age 30 months,' is no more reasonable than to speak of their mean weight as being 'ponderal age 30 months.'" Both processes are correlated with time, but not closely; and he describes a new method of assessing maturity in which each round bone and epiphysis is considered regardless of the ossification pattern; small increases of maturity are recorded; the same standards are used for both sexes; and finally maturation is given a yardstick of its own, the units being termed Oxford maturity units.

This method was used in a pilot study of 97 children from the Oxford child health survey.[17] Since then Acheson et al.[18] have applied it to some 600 children from birth to 5 years of age. Scores are given to bones in the hand and wrist-joint for each definite change in shape, maturity indicators described by workers already mentioned being used. The principle is that the sum total of the units scored by any bone will indicate its degree of maturity. The knee is also used, and indicators are suggested on the basis of 1200 serial films of this joint. (Sick's [19] account of this joint was not sufficiently detailed.) Stuart [20] and his co-workers in Boston, finding the wrist unsatisfactory, are analysing their comprehensive data with a view to producing information on the maturation of the knee; and we understand that another group in the U.S.A. have just completed an atlas on this joint.

Acheson is careful to emphasise that his method of computation is experimental. At present it is uncertain whether we can legitimately assume that round-bone and epiphyseal development proceed at a parallel rate. Again, different bone areas of the body may mature at different rates; so should "maturity indicators" for one area be added to those for another in order to give a truer picture of the total maturity?

As Krogman [21] has said, a 100% level of morphological maturity is inevitable in the healthy human, and accordingly Acheson suggests that when the whole age-range of the growing human is investigated it would be logical to express skeletal maturity as a percentage. (Some workers hold that final adult height can be predicted by assessing skeletal maturity during growth.[22]) Acheson's work shows the need for considering skeletal maturity in terms other than time; and it clearly points the way out of the present unsatisfactory situation.

NO SOVEREIGN REMEDY

IT can be harder work to ameliorate symptoms than to prescribe a complete and perfect remedy. Problem families, according to the fourth Southampton survey [23] on the subject, have no single cause, and there is no single remedy for them; nevertheless, the authors of the survey—Mr. E. T. Ashton, Mr. C. J. Thomas, and Prof. P. Ford (all of the department of economics of the University of Southampton)—do not suggest that the amelioration of symptoms need be given up. They were asked by Dr. H. C. Maurice Williams, medical officer of health for Southampton, to study the problem family "in the administrator's sense"—in the sense, that is, of the problems requiring solution they present from day to day.

The survey team have analysed all the cases brought up to, and accepted by, the Southampton social rehabilitation committee as problem families between Jan. 1, 1952, and Dec. 31, 1953. There were 104 such families, but, as is pointed out, behind this "accepted" group is a much larger group of marginal cases. Many of the difficulties of these families can be traced to the character, initial endowment, and emotional and educational history, of family members, and to the emotional relations between them; and "such intricate personal matters cannot easily be expressed in averages, and the truth

1. Wilms, M. *Fortschr. Röntgenstr.* 1902, Ergänzungsband 9.
2. Carter, T. M. *J. educ. Psychol.* 1926, **17**, 237.
3. Baldwin, B. T. *Univ. Ia Stud. Child Welf.* 1928, **4**, 1.
4. Sawtell, R. O. *Amer. J. Dis. Child.* 1929, **37**, 61.
5. West, E. D. *Harv. Teach. Res.* 1936, **6**, 162.
6. Sontag, L. W., Lipford, J. *J. Pediat.* 1943, **23**, 391.
7. Lurie, L., Levy, S., Lurie, M. L. *Ibid*, p. 131.
8. Pyle, S. I. *Ibid*, 1948, **32**, 125.
9. Maresh, M. M. Personal communication.
10. Todd, T. W. Atlas of Skeletal Maturation. Part 1: The Hand. St. Louis. 1937.
11. Hellman, M. *Amer. J. phys. Anthrop.* 1928, **11**, 223.
12. Flory, C. D. *Monog. Soc. Res. Child. Developm.* 1936, **1**, 3.
13. Greulich, W. W., Pyle, S. I. Atlas of Skeletal Development of the Hand and Wrist. Stanford, 1950.
14. Speijer, B. Beteknis en Bepaling van de skeletleeftijd Sijthoff. Leiden, 1950.
15. Mackay, D. H. *Trans. R. Soc. trop. Med. Hyg.* 1952, **46**, 135.
16. Acheson, R. M. *J. Anat.* 1954, **88**, 488.
17. Stewart, A. M., Russell, W. T. *Med. Offr*, 1952, **88**, 5.
18. Acheson, R. M., Kemp, F. H., Parfit, J. *Lancet*, 1955, **i**, 691.
19. Sick, C. *Fortschr. Röntgenstr.* 1902, Ergänzungsband 9.
20. Stuart, H. C. Personal communication.
21. Krogman, W. M. *Child Developm.* 1950, **21**, 25.
22. See *Lancet*, 1952, **ii**, 328.
23. Problem Families. Oxford: Blackwell. Pp. 51. 4s.

can easily slip through a fine statistical mesh." Nevertheless the analysis provides much information useful to administrators.

There were 32 broken families, with either a male or a female head only. In the 72 "natural" families (consisting of man, woman, and children) the parents were legally married in 57 cases, and living together in more or less stable union in 15 cases. The 104 families had a total of 470 children, nearly a third of them being illegitimate. In 32 of the families one or more of the members was mentally subnormal; and 22 families (a fifth of the total) contributed 27 subnormal adults and 8 subnormal children. In 4 families both parents were subnormal but the children were not. In addition, 1 member in each of 11 families had been treated for mental illness. There were 102 reports of either neglect or cruelty to children: 50 reports of neglect, 35 cases of children sent to homes, and 17 cases of cruelty. Of the 104 families 12 contributed 17 cases of juvenile delinquency (as compared with 230 cases for the population of Southampton as a whole); 9 of these delinquents came from families in which one or both parents had a police record. Many of the families were in money difficulties—whether from actual poverty or from mismanagement of income—and 74 received financial assistance of some kind, 60 of them in the form of emergency cash grants. Grants in kind—bedding, clothing, coal, food, travelling vouchers, and the like—were given in 37 cases.

Nine separate departments, or statutory or voluntary agencies, could be called in to help these families. The "designated officer" responsible for securing full coöperation between all such agencies varies in different parts of the country: in about half the local-authority areas the children's officer is the designated officer, in others the clerk of the council or the chief education officer. In Southampton and several other areas the designated officer is the medical officer of health. The authors of the survey thought this a good choice, not only because the M.O.H. knows all the relevant bodies, and is in touch with adults as well as children, but because he is concerned with the conditions of the home, and has besides great local influence. In Southampton, his health visitors report changes and new needs to the social rehabilitation committee, and do much of the work needed to set problem families on their feet—appealing skilfully to the love most parents bear their children, advising on diet, health, and safety measures, teaching young mothers to feed and wean their babies, and persuading mothers to attend the child-welfare clinic, and attend it regularly. The survey team suggest that some health visitors should be trained to work not only with the welfare but with the child-guidance clinic. They commend the practice, followed in Southampton, of helping problem families to graduate to decent homes, sometimes directly and sometimes by way of "half-way accommodation." It has been possible to send some mothers to training centres in mothercraft, such as the Brentwood Home in Cheshire, the Mayflower Home at Plymouth, or Spofforth Hall in Yorkshire.[24] Many of the mothers are in such poor health, as a result of much childbearing, that voluntary sterilisation, it is suggested, might help some of them. The children's department, the survey team thought, cannot make much direct contribution to *family* rehabilitation, though it can do much for the children when the family has broken down. It would be interesting to know whether this is the experience of most children's departments, or whether it is more usual for them to be concerned with the family as a whole.

The main need of problem families is "for someone to help them run the home, plan meals, arrange the cleaning and other household chores, and to organise their disorderly budgeting." The parents of a problem family, in fact, often seem to need good parents of their own: and in some cases the place of these can be supplied by Family Service Units. Where the parents are difficult or psychopathic, however, case-work might be more closely linked, the team suggest, with mental or child-guidance clinics. When all else fails, the children at least can be given the chance of a more normal home life in foster-homes. Since there is no sovereign remedy, methods must be varied and flexible. Where obstacles are great, success is the more rewarding.

24. See *Lancet*, 1952, i, 1154; *Ibid*, 1953, ii, 460.

A CORONER'S CRITICISM

A MAN with multiple injuries was taken to a small hospital. The hospital was in the charge of a recently qualified house-surgeon, because the resident surgical officer was away for the weekend. The house-surgeon arranged for transfer of the case to a hospital with more senior resident staff and nearer consultants. The patient died soon after arrival at the larger hospital. At the inquest, the coroner is reported [1 2] to have criticised the system whereby an inexperienced doctor is required to make such important decisions; and he hoped for a return to conditions before the National Health Service "when there was always someone of experience at a hospital to give emergency treatment."

For some years past it has been apparent that the Law does not regard a recognised medical qualification as sufficient evidence of competence to carry out routine hospital duties. This may always have been so in Law, but in practice it is only since the National Health Service began that it has been emphasised with any frequency. It has already been held [3] that a recently qualified doctor is not necessarily responsible enough to administer certain anæsthetics, and it would seem from other legal findings,[4] as well as from the coroner's remarks, that a recently qualified doctor may not necessarily be sufficiently responsible to decide the disposal of cases which come to his hospital. Hospitals are well aware of this, and are tending to appoint residents of greater seniority and experience to their receiving-rooms and casualty departments. The Health Service can hardly be blamed because, as yet, there are not enough suitable men ready to fill all the jobs. It may be that before the National Health Service every hospital had someone of sufficient experience available, for the house-surgeon himself was usually so regarded. Many will recall the respect in which the house-surgeon was held by the community in those days.

The alternative interpretation of the coroner's remarks in this case is that the establishment before 1948 actually provided better emergency cover in hospitals than it does at present, and if this is what he meant his remarks seem open to question. We find it difficult to believe there is less—or less experienced—skill available in hospitals since the coming of the Health Service. The present shortage of residents has several causes, but one of the most important is the considerable increase in staff establishments since the reorganisation of the hospitals, and in particular since an attempt has been made to increase the efficiency of peripheral hospitals, such as that to which the coroner referred. We understand that the number and type of residents at the hospital concerned is virtually the same as it was in 1947, and that there is authority for one more when he becomes available. There are more consultants on the staff than there were eight years ago. The misfortune which led to the inquest seems to spring from the fact that, on the day in question, one of the hospital's most important residents was on holiday. This could have happened before 1948, as easily as today. We have lately suggested [5] that arrangements for the reception and disposal of casualties in hospitals could be improved; but we believe progress is being made. The coroner's remarks imply that we are going backwards, but we can see no justification for this stricture.

1. *Times*, Aug. 3, 1955.
2. *Manchester Guardian*, Aug. 3, 1955.
3. *All-England Law Reports* (1952) (2), 125.
4. *Brit. med. J.* 1953, i, 166.
5. *Lancet*, July 30, 1955, p. 233.

Special Articles

ADMINISTRATIVE AND SOCIAL PSYCHIATRY

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" Psychotherapy is a technique now widely practised and studied and one held in high prestige. In contrast, administrative psychiatry, the influencing of ' the other twenty-three hours ' of treatment, is more widely practised but is little studied and is of relatively low prestige."

Stanton and Schwartz's book *The Mental Hospital*,[14] from which these words are taken, highlights a trend that may have a profound effect on psychiatric thinking. We are becoming more and more aware of the patient's social context as contributing emotional factors important in the development, treatment, and rehabilitation of mental disorders. It is increasingly apparent that we must study the social organisation of psychiatric hospitals with a view to improving communications and integrating administration and therapy into a total treatment programme.

In recent years the support of foundations and governments has made possible for the first time sustained collaboration between members of the theoretically oriented disciplines and those of the more practical kind. As a result, research has been developing along many new lines. Historical documents have been examined for trends in the incidence of psychiatric disorders; hospitals have been analysed as institutions whose social functions affect treatment; and empirical studies based on epidemiological designs have been set up in field laboratories. The paired names of psychiatrists and social scientists have become common in the professional journals of both fields (e.g., Hollingshead and Redlich of Yale,[4] Ruesch and Bateson of the Langley Porter Clinic [12]).

Social scientists have collaborated with psychiatrists in studying staff-patient relationships in various hospital settings, and we are beginning to understand the informal processes of hospital life and their relevance to the treatment programme.

Caudill,[1] a social anthropologist, was admitted as a patient to a private mental hospital in New England and studied the ward life from the point of view of the patients, while a psychiatric collaborator recorded the flow of events from the official viewpoint of the staff. He notes that " while the staff exercised control over the patients, they did not give recognition to the patient world as a social group, but rather, they interpreted the behaviour of the patients almost solely in individual dynamic-historical terms. The patient group, thus lacking an adequate channel of communication to the staff, protected itself by turning inward, and by developing a social structure which was insulated as much as possible from friction with the hospital routine. Nevertheless, such friction did occur, and the subsequent frustration led to behaviour on the part of patients which, although it resembled neurotic behaviour arising from personal emotional conflicts, was, in fact, to a considerable extent due to factors in the immediate situation."

Informal social processes in psychiatric hospitals are more important to therapy than has usually been assumed.

New Benefits and New Problems

Some psychiatric groups, which aim at harnessing these processes in the interests of treatment regard the " freeing of communication," almost as a panacea. But this freedom raises fresh problems of its own once communications are free—problems of understanding the meanings of various types and levels of communication, problems of handling and applying the knowledge obtained, problems of reaching consensus about the goals to which the knowledge is to be applied, and so on. On the other hand there are clearly many areas in which the inhibition of free communications is antitherapeutic for patients and demoralising for staff. Stanton and Schwartz by their long-term study of the life of a mental hospital ward, have fully demonstrated the importance of its social organisation.

The ward which they studied was at Chestnut Lodge, a private psycho-analytic hospital associated with the Washington School of Psychiatry. It treats 60 patients (mostly schizophrenics) with a staff of 21 therapists (psycho-analysts), 5 administrative doctors, 20 trained nurses, 50 nursing aids, and 10 student nurses. Clearly no hospital in this country could afford such a generous staff, even if it were considered desirable, and the findings are not directly applicable to the practice here. But they offer principles from which many lessons can be derived.

Administrative and Treatment Staff

At Chestnut Lodge different doctors are in charge of the routine ward life and of the treatment of the patients. This unusual situation gives a unique opportunity to assess the therapeutic effect of each kind of influence on the patient.

The explicit functions of the administrator are clear enough, but too little attention has been paid to his implicit functions. In mental hospitals both in Europe and America the physician-superintendent has formal administrative duties which take up most, if not all, of his time and energies, and he has little or no direct clinical contact with the patients. The extent to which he is in contact with his staff varies enormously according to the personalities of the superintendent and his staff, the size of the hospital, and the established traditions. Moreover, on appointment as superintendent he is switched suddenly from a therapeutic to an administrative rôle; and, compared with his long medical and psychiatric training for his former responsibilities the doctor has practically no training for administration. The transition might be likened to an appointment to Ministerial rank in the absence of any permanent Civil Service to guide and support the new Minister in carrying out his duties. It is hardly surprising that administrative difficulties should sometimes give rise to dissatisfaction among the staff, who then inevitably act out some of their conflicts on the patients. Faced with a situation which seems insoluble, the inexperienced or unskilled administrator may resort to defensive attitudes. He may, for example, become more authoritarian, which may temporarily relieve his feelings of insecurity but at the expense of increased staff tensions. This may lead to further lowering of staff morale and impairment of effective treatment.

Stanton and Schwartz describe how episodes of pathological excitement occurred in schizophrenic patients at times when there were rivalries, disagreements, and misunderstandings among the staff members. (These were presumably communicated in a non-verbal if not unconscious way.) Even more important is their evidence that many hours spent in unravelling the staff tensions coincided with clinical improvement of the patients. At Chestnut Lodge, where different people were responsible for administration and therapy, the unravelling of tensions depended on their mutual interest and capacity for working through differences of perceptions, cleavages of policy, and failure of communication. Where such interest and/or capacity are lacking, someone with enough skill and authority to compel attention would

be needed to work these difficulties through. If he is to base his analysis and integration on non-authoritarian methods, he must be outside the immediate authority hierarchy—perhaps an administrative officer or medical superintendent trained in psychotherapy, or an action-oriented social scientist.

Psychiatrist and Nurses

At Chestnut Lodge, despite a generous staff-patient ratio, staff of high calibre, a great tradition for treatment, and a highly organised system of seminars, there were 2 psychotic episodes and 1 suicide among the trained nurses, and 7 psychotic episodes and 2 suicides among the nursing aides, during a two-year study.

Stanton and Schwartz made a careful job-analysis of the nursing rôles in their hospital. Like other studies, it shows that the aides who had the lowest status in terms of prestige, salary, and authority were the people in most intimate contact with the patient. Much of the information about the patients which they could have communicated to the doctors was not fed back because the social organisation made no provision for this. Opportunities for collaboration between the doctors and the senior nurses were better. This scale of diminishing communication between nurse and doctor according to the nurse's official status is found almost everywhere, but its justification is increasingly questioned. This tradition, like so many in our mental-hospital system, seems to have developed less through the treatment needs of the patient than for the convenience of the staff.

Staff and Patients

In the share the patient took in his own treatment Chestnut Lodge falls short of the most advanced trends in psychiatry. Most of the patients are severe schizophrenics, but this fact should not in itself limit their participation as much as it seems to at Chestnut Lodge. At Boston Psychopathic Hospital even severely disordered patients share in administrative decisions as well as in decisions about their own amusement.

The experience at Boston,[5] Belmont,[7 8] and other centres, where patient-staff communication has been much increased, shows that a complex of processes emerge—full of difficulties, pain and anxiety, excitement, and new knowledge. When patients have been allowed to express their feelings about the treatment situation and their relationships within it, several kinds of things have characteristically happened:

(i) New knowledge, perhaps of a more accurate kind, has been made accessible to the staff about the problems current in the ward life. Thus if a noisy or aggressive patient is creating problems within the hospital, it is other patients who must live with him who know the details of his behaviour most accurately; their ability to tolerate and develop relationships with him is an important criterion of whether he ought to be transferred elsewhere or not. Moreover, the patients have more knowledge of the causes of ward tensions, and with their help a more accurate diagnosis of the situation can be reached. In the more conventional system, it might more easily happen that the wrong patient is sent to the disturbed ward in an attempt to alleviate ward tension.

(ii) Patients who do participate not only achieve cathartic relief, and often show clinical improvement, but are able to participate in the treatment of other patients. The intimate relationships among patients often serve to "open up" difficult cases to psychotherapy. As patients come to share more in administrative decisions and in the therapy of their fellows, as well as in planning their entertainments, they identify with the ward and hospital to a great degree. This identification, if developed in a programme that is oriented to rehabilitation rather than hospitalisation is helpful in affecting treatment. In such a situation, the interpretations of psychotherapists and other staff may be more readily accepted.

(iii) Staff need to tolerate a higher level of anxiety and to treat their own problems through frequent and skilfully handled staff-meetings. The freeing of patient communications not only faces the staff with heightened forms of unsolved and unsolvable problems, but also inevitably directs toward them a large amount of hostility. If they are deprived of their institutional defences, and the patients are allowed to question and scrutinise traditional prerogatives in terms of their relevance for therapy, stresses often develop which might become unbearable unless adequate facilities for staff treatment exist.

The freeing of communications often creates problems that are, for the time being, unmanageable and distressing. On balance, however, it seems desirable because, whether they are recognised or not, these problems do exist and must be faced sooner or later if the type of treatment outlined in this paper is to be carried out.

With the exception of specialised organisations, such as the Veterans Administration Hospitals, the rehabilitative aspect of treatment is not so well developed in America as in Britain. Again the emphasis laid in America on the exclusive efficacy of the treatment hour hinders the practice, which is spreading in this country, of enlisting the help of the patient's family. In centres where illness is seen to be a characteristic of relationships as well as a property of individuals, patients' relatives are being increasingly brought into the treatment situation. Discussion groups of patients and relatives, and at Belmont even the admission of relatives to the hospital for treatment along with the patient, have grown in importance.

A Fresh Approach

How can the psychiatric hospital be reorganised so that its therapeutic potential, implicit as well as explicit, is used most effectively? Some administrative tasks have little relevance for therapy, but others have a much larger relevance than has been supposed. Administrative psychiatry in this country could come into play at two levels: (*a*) that of the physician-superintendent, who is mainly concerned with over-all hospital administration and the relation between the hospital as a whole and the external world; and (*b*) that of therapeutic subsystems, such as wards, firms, and special units, ordinarily under the direction of a consultant psychiatrist.

Whether it is the physician-superintendent, or the consultant, or some more detached person who is to be concerned with the administrative aspects of treatment, he must be able to relate freely to both patients and staff. To this end the general principle of semi-autonomous treatment teams within the larger hospitals has been strongly recommended by the World Health Organisation expert committee on mental health.[16] Such teams, enhancing face-to-face relationships, are already common in some hospitals, and where successful they achieve freer communication and integrated team-work. In our mental hospitals the ward psychiatrist usually performs both therapeutic and administrative tasks. What is necessary to improve treatment, once the relevance of administrative factors is recognised, is the freedom for clinical teams to carry out programmes appropriate to their own ward or unit situations. Under the National Health Service consultants have full responsibility for the treatment of their patients. It would seem desirable that wherever practicable they should develop a social organisation within their wards which allows the freest possible communication within the staff, and between staff and patients. Such a growth will depend partly on the relation between the ward and the larger hospital, and partly on the treatment ideology of the ward itself. The external relation of the ward could be coördinated by the physician-superintendent if he were sufficiently aware of the therapeutic implications of his administration.

Within the treatment wards or units the problems are different. The careful selection of staff is, of course, a prerequisite for good treatment, but it is not enough. Staff meetings and tutorials are necessary for the discussion of emotional involvements of staff in the work as well as for the communication of information relevant to treatment. The reluctance of many doctors to give up their prerogatives of unquestionable authority has hampered these collaborative procedures. The sharing of perplexities, anxieties, and so on with the lower echelons of the staff has many mutual benefits. It frees the flow of useful communications to the psychiatrists, and increases the clinical teams' effectiveness. *The Lancet*,[9] referring to the difficulty of recruiting and retaining mental nurses in even our most famous teaching hospitals, recently quoted the report of the Maudsley and Bethlem Royal Hospitals on the function and training of mental nurses which suggests that every student nurse might with advantage be attached to a psychiatric firm. This would, it is hoped, allow her a greater share in treatment and improve communications between nurses and doctors. Experience suggests that good rather than harm results from this collective approach which lessens the gulf between doctors and nurses in most of our psychiatric hospitals. The nurse, whether experienced or not, is helped to find a treatment rôle and feels that she has a special contribution to make through her greater contact with the patient. This is why she came to nursing and it is difficult to see why she should not play a useful part from the day she arrives on the ward, if interest and guidance is available through frequent staff seminars. For many of the problems of nursing recruitment we have only ourselves to blame.

The changes needed to reform the mental hospital system can succeed only with the support and good will of senior administrative personnel. Physician-superintendents, matrons, and others cannot give up their privileged defences unless they feel secure enough to expose themselves to the disruptive consequences of a permissive system. The delegation of authority to semi-autonomous treatment units will raise new problems of intra-hospital administration, and these, like the others, can only be worked through by critical self-appraisal, and freedom of communications from those most concerned—the patients and treatment staff.

We are indebted to Dr. Louis Minski, physician-superintendent at Belmont Hospital, and to Miss P. Arnold, Matron, for their coöperation in the development of social psychiatric practice and research at the social rehabilitation unit.

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JOINT CONSULTANTS COMMITTEE

A MEETING of the Joint Consultants Committee was held in London on July 27 under the chairmanship of Sir Russell Brain.

The committee received from a subcommittee a report on exploratory discussions which had taken place with the Ministry of Health a few days earlier on the subject of hospital medical staffing. At the beginning of these discussions the Ministry had made the reservation that plans for reorganising the medical staffing structure should not be used as a means of securing salary increases, which were a matter for Whitley negotiations. The members of the subcommittee had replied that, as adequate recruitment of hospital medical staff was one of the fundamental problems, the question of salary ranges was entirely relevant and could not be ignored. Apart from this disappointing beginning, the discussions had been useful and constructive.

One of the major points made by the subcommittee had been that the rigid training ladder should be abolished, and appointments made according to the needs of the hospital. To secure adequate training through experience in suitable appointments would be the responsibility of the aspirant to consultant status. There would be no limitation of the number or variety of posts he might hold, and he would not lose his prospect of promotion solely by the operation of a time factor. Appointments would be renewable in competition, or in some cases (in the higher posts) of indefinite tenure; and posts comparable with the present senior-registrar posts might be temporarily upgraded as necessary to retain the services of promising men, pending opportunities of appointment to consultant vacancies.

The Ministry had been critical of the suggestion that there should be a comprehensive central review of establishments. The previous reviews had not proved entirely satisfactory, and the Ministry thought that the changing needs should be kept under continuous review locally and only special problems referred for decision centrally. The subcommittee had agreed that the initiative should be taken at the hospital level, but thought that past experience pointed to the need for over-all planning.

Among other matters which had been discussed with the Ministry were the machinery for making appointments and the means of attracting practitioners back into hospital appointments after completion of National Service.

The Ministry had undertaken to put its own views on hospital medical staffing into writing as a basis for further discussions.

The committee also received a report of a meeting with the chairmen of the Regional Hospital Boards in England and Wales, at which the main subject discussed had been the development of suitable medical advisory machinery at the regional-board level. The views expressed on behalf of the Joint Committee at this meeting were published in these columns on Aug. 6.

It was reported that, after discussions between representatives of the Joint Committee and the Ministry on the retiring age and superannuation benefits of mental-health officers, the Staff and Management Sides of Committee B of the Medical Whitley Council had agreed to delete from the terms and conditions of service the provision requiring hospital medical staff classified as mental-health officers to retire at the age of 60. The effect of this is that mental-health officers will retain their special superannuation benefits but may continue in the hospital service until 65 if they so desire.

A request was considered for the views of the committee on the practice adopted by a number of non-teaching hospitals of offering facilities for senior medical students to obtain additional experience during their holiday periods. While reaffirming the opinion previously expressed to the Ministry that the employment of students

as house-officers should in no circumstances be allowed, the committee considered that the granting of facilities to students to gain additional experience *as students* should be encouraged in every way. Some hospital authorities were tending to discourage this practice because of the fear of litigation, but legal advice which the committee had obtained made it clear that the liability of a non-teaching hospital in respect of such students differed in no way from that of a teaching hospital.

Resolutions were received from the dermatologists' and venereologists' groups of the British Medical Association which urged that combined appointments in the two specialties should be opposed. These resolutions had been endorsed by the Central Consultants and Specialists Committee, and the Joint Committee agreed that, although in some areas there might be difficulty in making satisfactory arrangements for the staffing of venereal diseases departments, the solution of the problem did not lie in the combination of venereology with dermatology. It was decided that the matter should be discussed with the Ministry.

Other matters discussed included the proposals for statutory registration of medical auxiliaries, the operation of the "moral obligation" clause in paragraph 16 of the terms of service, and the expansion of the senior-registrar establishment in anæsthetics and certain other specialties.

Conferences and Congresses

CLINICAL ENDOCRINOLOGY IN U.S.A.

THE 37th annual meeting of the Endocrine Society of the United States was held at Atlantic City on June 2–4, under the presidency of Dr. ALLAN T. KENYON. The papers were strictly limited to ten minutes each, and this demanded not only rapid reading but also high receptivity in the audience, 24 papers being read on the first day alone. The mental receiving-sets in the audience avoided fatigue by practising selectivity, and there was much coming and going in the large auditorium.

The following is an abstract of some of the papers of most clinical importance.

The Thyroid

Thyropituitary Relations in Cretinism and Hypothyroidism

A. M. DIGEORGE, S. A. D'ANGELO, and K. E. PASCHKIS (Philadelphia) had demonstrated, by tadpole bio-assay, that, while the thyroid-stimulating-hormone (T.S.H.) levels were frequently raised in hypothyroidism, in some cases they were low or even absent. Therefore a reduced or negative T.S.H. level cannot be taken to indicate a pituitary origin for the hypothyroidism. In some cases T.S.H. returned after thyroid therapy had been started, which suggested that the synthesis or release of T.S.H. may sometimes require the presence of thyroid hormone. In the discussion Dr. Paschkis observed that all functions of the pituitary may not be equally affected, since a high output of F.S.H. may occur in hypothyroidism.

Therapeutic Implications of the Avidity of Solitary Thyroid Nodules for ^{131}I

M. PERLMUTTER and S. L. SLATER (New York) had compared the uptake of ^{131}I in non-toxic nodules with the uptake in a non-nodular area of thyroid tissue in the same patient. The nodule was described as "hot" if the uptake was higher than that of the surrounding tissue, and "cold" if the uptake was identical with the thyroid uptake. The 22 malignant nodules thus assessed were "cold." Of the 97 non-toxic nodules 65 were "cold" and 32 "hot."

In the discussion Dr. E. B. ASTWOOD observed that it was the "cold" nodules—those not avid for iodine—which responded best to thyroid therapy.

The ingestion of thyroid hormone significantly decreases the thyroid uptake of ^{131}I in 95% of euthyroid subjects and in only 3% of thyrotoxic patients.[1] Dr. Perlmutter and Dr. Slater had therefore applied this test to thyroid nodules. All the toxic "hot" nodules and half the "hot" non-toxic nodules showed no depression of ^{131}I uptake after thyroid hormone. While definite depression of the uptake curve indicates euthyroidism in nodular goitre, an unvarying uptake does not indicate hyperthyroidism.

Deiodination of Thyroxine to Triiodothyronine by Kidney Slices of Rats with Varying Thyroid Function

F. C. LARSON, K. TOMITA, and E. C. ALBRIGHT (Madison) concluded, from their researches with kidney slices in rats, that there is a deiodinating system in the tissues which converts thyroxine to triiodothyronine; and they postulated that this enzyme system is adaptive, since deiodination is enhanced by increasing the amount of thyroxine present in the tissue.

Metabolism of Triiodothyronine and Thyroxine in Plasma, Pituitary, and Central Nervous System of the Rabbit

J. GROSS, D. H. FORD, and M. POSNER (New York) had shown, by injecting rabbits with ^{131}I-labelled triiodothyronine and killing them at various intervals after injection, that the plasma activity fell rapidly and at four hours was predominantly in the form of iodide. There was, on the other hand, a rapid entry of radioactivity into the pituitary and the diencephalon. The concentration of ^{131}I was highest in the posterior pituitary and lower in the anterior lobe, which respectively attained over 20 and 7 times the plasma-^{131}I concentration at four hours. Most of the concentrated radio-iodine was identifiable as triiodothyronine. Dr. Gross emphasised that these results did not necessarily apply to other animals in the same degree. When labelled thyroxine was similarly injected, the concentration of radio-iodine was demonstrable only in the posterior pituitary.

A Study of Endemic Goitre

M. ROCHE, F. DE VENANZI, J. VERA, E. COLL, and M. S. BERTI (Merida) reported a survey in a goitrous region in the Venezuelan Andes. Palpable thyroids were found in 84·5% of 718 adults examined and in 83·0% of 641 school-children. In 44·2% of the adults and 31·4% of the children the goitres were visible as well as palpable. Radio-iodine tests showed that the glands were avid for iodine: the forty-eight-hour radio-iodine uptake in 100 adults averaged 74% and in 28 children 79%. No statistical difference in the iodine-uptake curves could be demonstrated between those adults with a goitre and those without. Potassium perchlorate in doses of 300 mg. two hours after administration of ^{131}I decreased the radioactivity in the thyroid of 11 out of 13 goitrous subjects tested—a result which suggested that part of the thyroid iodine in endemic goitre is in the unbound state.[2]

The Pituitary

Analysis of the Polyuria Produced by Hypophysectomy in Man

M. B. LIPSETT, J. P. MACLEAN, M. C. LI, C. D. WEST, B. S. RAY, and O. H. PEARSON (New York) reported that polyuria occurred in 67% of cases in which a complete hypophysectomy had been performed, but it was not seen when the pituitary stalk remained intact. They did not report the succeeding oliguric interphase described by Ikkos, Luft, and Olivecrona[3]; nor did they observe that the subsequent polyuria depended on the presence of cortisone.

Effect of Partial Hypophysectomy on Adrenocortical, Thyroid, and Gonadal Function in the Dog

W. F. GANONG and D. M. HUME (Boston) confirmed the clinical observation that, in lesions destructive of the pituitary, gonadal function was depressed first, then thyroidal, and finally adrenocortical. They removed varying amounts of pituitary tissue in 31 dogs. More than four-fifths of the pituitary was removed before any abnormality could be demonstrated in the target glands. For complete suppression of adrenocortical activity it was necessary to remove the whole pituitary, and minute fragments remaining were capable of supporting significant compensatory hypertrophy in the adrenal cortex.

Reproduction and Sex Hormones

Congenital Gonadal Dysgenesis, Ovarian Agenesis, Male Pseudohermaphroditism: the Relationship to Theories of Human Sex Differentiation

M. M. GRUMBACH, J. J. VAN WYK, and L. WILKINS (Baltimore) had investigated 17 patients with ovarian agenesis by

1. This is the basis of S. C. Werner's test for thyrotoxicosis. (*Bull. N.Y. Acad. Med.* 1955, **31**, 137.)

2. These results are similar to those reported by J. S. Stanbury (*J. clin. Endocrin.* 1953, **13**, 1270) in a goitre survey in western Argentina.

3. *J. clin. Endocrin.* 1955, **15**, 553.

skin biopsy to determine the sex chromatin pattern, and found it to be male in 15. For these cases the name of congenital gonadal dysgenesis was suggested. The hypothesis of Wiesner [4] and Jost [5] that there is an inherent tendency of the fœtus to feminise, which in males is counteracted by the embryonic testes, was accepted. The syndrome of ovarian agenesis was therefore due to gonadal dysgenesis, and the authors suggested that this more exact name should be adopted. The two remaining patients were transitional cases between gonadal dysgenesis and male pseudohermaphroditism.

Urinary Excretion of Interstitial-cell-stimulating Hormone (I.C.S.H.) by Women with Normal and Abnormal Menstrual Function

J. W. McARTHUR, F. M. INGERSOLL, and J. WORCESTER (Boston) had assayed the urine of women for the presence of interstitial-cell-stimulating hormone by measuring the weight of the ventral prostate of the hypophysectomised male rat. Two peaks of output were described, the first just after the mid-cycle and the second in the late luteal phase. These peaks were remarkably constant in the same individual, and abnormal patterns had been demonstrated in various gynæcological disorders. Dr. McARTHUR insisted, in reply to Dr. SEGALOFF, that these peaks were not identical in time with those produced by prolactin.

Eunuchoidism with Negative Follicle-stimulating Hormone in the Female

M. P. MOLDAWER, F. ALBRIGHT, P. H. BENEDICT, A. P. FORBES, and P. H. HENNEMAN (Boston) had discovered four female patients with eunuchoidism in whom there was no follicle-stimulating hormone (F.S.H.) output. They assumed a selective pituitary F.S.H. deficiency comparable to that which occurs in males; but whereas the males responded to chorionic gonadotrophin, ovarian function in the female patients with eunuchoidism showed no such response.

The New Steroids

19-Nortestosterone

Two papers were read on the effects of 19-nortestosterone.

D. E. HOLTKAMP, A. E. HEMING, and L. F. MANSOR (Philadelphia) had compared its activity, both metabolic and androgenic, in castrated male rats. By subcutaneous injection anabolic stimulation was identical, but the androgenic effect of testosterone was five times greater than that of 19-nortestosterone. By oral administration a satisfactory anabolic effect was attained with a still weaker androgenic effect.

W. H. BAKER, P. H. HENNEMAN, B. BAGGETT, L. L. ENGEL, D. TIBBETTS, and S. B. and M. BROWN (Boston) showed, by nitrogen, calcium, and phosphorus balances, that 19-nortestosterone was anabolic in a patient with breast cancer metastatic to bone. However, androgenic effect also was observed, as shown by an increase in facial hair, flushing, and acne.

In the subsequent discussion it was agreed that 19-nortestosterone was a potent anabolic agent and had less androgenic effect than any compound yet synthesised.

Metacortandracin ('Meticorten') and Metacortandralone ('Meticortelone')

H. S. KUPPERMAN, M. G. H. BLATT, and H. WIESBADER (New York) had assessed the effectiveness of meticorten in the adrenogenital syndrome, in comparison with cortisone and hydrocortisone, by the degree of depression of ketosteroid excretion at different dose levels. They concluded that meticorten was twice as active as hydrocortisone which itself is 30% more active than cortisone.

M. M. PECHET and F. C. BARTTER (Bethesda) concluded from metabolic studies with these steroids in addisonian patients that both meticorten and meticortelone produced less sodium retention and less nitrogen loss than did cortisone and hydrocortisone in comparable therapeutic dosage.

9-Alpha-fluorohydrocortisone

A. GOLDFIEN and others had assessed the potency of this steroid in suppressing adrenocortical activity in various conditions. In the normal only 1–2 mg. daily was required; in women with mild virilism 2 mg. daily; two women with the adrenogenital syndrome required 5 and 25 mg. daily, while four patients with Cushing's syndrome showed no significant decrease with 5, 6, 10, and 25 mg. daily.

In the subsequent discussion it was generally agreed that 9-alpha-fluorohydrocortisone was the most powerful suppressor of adrenocortical activity yet discovered; but LAWSON WILKINS, using it in doses of 1 mg. daily in adrenogenital hyperplasia, had found that its action was not sufficiently prolonged and that 17-ketosteroids began to rise. KUPPERMAN had found that 3 mg. a day produced œdema in five patients with the adrenogenital syndrome.

Aldosterone

G. L. FARRELL, E. W. RAUSCHKOLB, and S. KOLETSKY (Cleveland) had found that after hypophysectomy in dogs the rate of aldosterone secretion remains at two-thirds of normal; which showed that the secretion of aldosterone is regulated by a physiological mechanism only partially interrupted by removal of the pituitary.

G. W. THORN and his group (Boston) had administered aldosterone to normal and addisonian patients in doses of 1 mg. daily. Considerable sodium retention resulted and an addisonian patient treated for seven days gained 3·5 kg. in weight and developed ankle œdema. No lightening in skin pigmentation occurred. No decrease in urinary steroid secretion resulted in a normal subject and therefore no suppression of corticotrophin activity had occurred.

Diagnosis and Therapy

Addison's Disease with Normal Basal Secretion of 17-Hydroxycorticoids

G. W. THORN and his colleagues (Boston) discussed a group of patients who enjoyed a state of well-being under normal conditions, but who showed adrenocortical insufficiency under stress. These patients excreted normal quantities of 17-hydroxycorticoids in the urine, but showed one or more of the signs and symptoms of classical Addison's disease, usually increased pigmentation. The diagnosis can only be made by administering intravenous corticotrophin for two or more days, when these patients failed to excrete increased amounts of urinary corticoids.

This method resolves the ancient controversy as to whether partial adrenocortical insufficiency exists, and provides a useful diagnostic tool. The results were confirmed by others who joined in the discussion.

Metabolic and Endocrinologic Consequences of Abrupt Cessation of Long-term Cortisone Therapy in Rheumatoid Arthritis

E. CALKINS, W. BAUER, L. L. ENGEL, and P. CARTER (Boston) had studied electrolyte and nitrogen balances, and the effect of abrupt withdrawal of cortisone after two to three years' therapy. They concluded that endogenous corticotrophin began to be effectively secreted on the fourth day after withdrawal.

The Prophylactic Use of Cortisone for Surgery of the Pituitary

P. TROEN and E. H. RYNEARSON (Rochester) reviewed 163 pituitary operations done at the Mayo Clinic in the last five years. There were 127 adenomas, 25 craniopharyngiomas, and 11 miscellaneous lesions. 94 of the patients had no pituitary insufficiency before operation, 37 had mild insufficiency, and 22 had severe insufficiency. 93 patients were given cortisone before operation. In patients with a considerable degree of hypopituitarism this preoperative administration of cortisone significantly decreased the incidence of postoperative endocrine complications.

The Effect of Œstrogen and Androgen on Calcium Metabolism During Cortisone Administration

P. H. HENNEMAN, J. W. IRWIN, D. M. K. WANG, and W. BURRAGE (Boston), by estimating the twenty-four-hour calcium excretion, had studied the calcium metabolism in 28 patients with chronic intractable asthma who had received prolonged cortisone therapy. A majority of these patients had hypercalcuria. Large doses of œstrogen in the females, or testosterone (300 mg. daily) in the males, reduced the calcium excretion to normal levels.

It was stated in the discussion that 200–300 mg. cortisone daily for four years was required for the development of clinical osteoporosis, and that testosterone in doses of 50 mg. daily was effective in prophylaxis.

D.V.H.

4. *J. Obstet. Gynæc., Brit. Emp.* 1943, **41**, 867.
5. *Arch. Anat. micr. Morph. exp.* 1947, **36**, 271.

In England Now

A Running Commentary by Peripatetic Correspondents

I NOTE (*Discovery*, August, 1955) that much more information about heavy-water reactors is now available. Zeep, the first Commonwealth reactor, was completed at Chalk River as long ago as 1945. With Dimple (Deuterium Moderated Pile Low Energy), Harwell acquired its first heavy-water reactor last year. Dido, late E.443, is taking shape there—it looks like a gasometer—and a second, Pluto, is at the planning stage. Bepo, of course, one of the two graphite-moderated research reactors at Harwell, is an old friend.

At Dido, Dimple, and Zeep
We're all permitted to peep,
And now that the Iron Curtain's down
Security officers scarcely frown
As the Russians come flying into Town
To see Dido, Dimple, and Zeep.

Pluto is still but a pimple
And Bepo's not so simple,
But if heavy water is your skink
Go to the Har Well's bosky brink
And gingerly, geigerly, take a drink
From Dido, Zeep, or Dimple.

Aeneas made Dido weep,
He was often a bit of a sweep,
He left her flat and he sailed the sea,
Saying "Plutonium's more to me,
I'll cross the Styx, And I'll have all three—
Dido, Dimple, and Zeep."

Incidentally, the subject of an Urbino majolica plate of mine, which has long baffled me, is now obvious. At the feet of three naked ladies, standing with arms entwined and suffering from advanced pseudohypertrophic muscular dystrophy, there gush forth three springs of what is clearly very heavy water. On either side, Sir John Cockcroft and Sir Christopher Hinton, white-haired and also in the nude, sit looking at this opening ceremony with a godfatherly air. Sir John is pointing an admonitory finger at some error of technique.

* * *

The other Sunday afternoon, the heat tempted me into the garden with a deck-chair and a paper-back snatched at random from the Penguin shelf. I arranged a cushion behind my head, and waited for industrious gardening sounds from neighbouring Edens to lull me to sleep. Along came the serpent, disguised as four-year-old James. "Would you like a *poum*, Daddy?" Yes, I would, if only to learn what a poum might be. James scuttled off to the end of the garden and came back with a highly inedible windfall from our neighbour's apple-tree. "Why do you call it a poum, James?" James's contemptuous glance implied that in his herbarium a poum is a poum is a poum. My paper-back, I found, was not Simenon or Chandler, but R. A. Wilson's *The Miraculous Birth of Language*; but there was nothing in the index about apples or poums, so I abandoned the idea of a restful Sunday afternoon and went indoors with a dozen questions fermenting in my mind.

POME [O.F. *pome* (F. *pomme*), L. *pomum*]. . . . Who brought this sleep-disturbing book into the home? . . . who pinched our abridged *Golden Bough*? . . . what did our ancestors call the Fruit? Robert Graves's *The White Goddess* is not a lot of help; it seems that the Tree produced five different sorts of fruit, not all of them pomes, according to the day of the week.

Later that evening the author of all the trouble solved part of the riddle by bellowing from upstairs: "I wanta napple!" I hurried to satisfy his demand and to probe for further information. "Is that a poum, James?" I asked. Momentarily the sneer of cold command flickered over his face, then he nodded tolerantly towards the scruffy toy that shared his pillow. "Teddy always calls them poums," he explained, "but that's a brambly," sinking his teeth in my offering from the fruit-bowl. That night I wooed sleep with pen and notebook:

Poum (pōōm) = unripe apple. Peripatetic, A.: *The Teddy-Bear Myth in Western Europe and the New World*. (London, 195–?) . . . (See Roosevelt, T.—U.S. President) . . . Why is there always a James involved in these language problems? . . . J. Peripatetic; J. G. Frazer; J. Joyce; William and Henry J. . . . Wasn't there a King James of Scotland (IV?) who had a theory on the spontaneous development of language? . . . Did the Sanskrits or the Ugrians have a word for poum? Look up A. of Discord; Hesperides, golden A. of . . . Look up also ancient terms for poppy capsule.

* * *

Main electricity has recently come down our lane. The brilliant illumination did not entirely dazzle us; we remembered stories of "cuts" to which we had listened with lofty cynicism when we were dependent on an old Lister engine. We bought a second-hand Aladdin lamp; but before anyone visited the county town eight miles away to get a mantle—your servant, the writer, who passes through it almost every day is considered incapable—we were plunged in darkness by a thunderstorm.

There was some confusion; we found an inadequate torch; we fell over things, especially over Storm, the Siamese cat; the dog which was suspected of having eaten rat poison appeared to be dying; the lightning and thunder were magnificent.

When the rain abated, we groped our way to the village and begged candles from an old inhabitant who has "been on the main" for many years and who therefore keeps a store. On our return the light suddenly blazed and the dog seemed perfectly well.

Our home-made light, always weak and often wilting, never actually went out, but now we feel almost urban and have made suitable preparations.

* * *

I have long maintained that the gastric insults undergone by British stomachs—or rather by stomachs in Britain—are due to our dislike of making ourselves conspicuous, rather than to a lack of the interest in food and cooking shown, for example, by the French. After all, since the war we never seem to stop talking about food, and the standard in many private houses is high. But, confronted with nauseous coffee, myxomatous Welsh rarebit, or a lipsticky cup, we mutter to our wives out of the corner of our mouths "I don't think we'll come here again, dear," and leave it at that. The Frenchman talks, loudly, and insistently. He may even wave his arms about, stand up, and, under extreme provocation, throw a plate or two. That gets action—of one kind or another.

The same goes for the hygienic insults to which we submit so tamely. We face anything from death to a mild touch of the Merrygowhimbles as a result of these unhygienic practices, and 140 of us, perhaps, go down with food-poisoning daily. I was acutely embarrassed by the pungent comments of an American colleague on the food-handling at a West-End milk bar, but I am sure they did good. So roll up, chaps, and join the Society of Complainers—medical and legal expenses paid and the chance of an extra course, such as I extracted from British Railways the other day. They say that a copy of *Le Club des Sans-Club* under your arm works wonders in a French restaurant, but when you come in with the badge of Querulous Types Inc. in your buttonhole, waiters and cats will turn pale and chefs will mutter out of the corners of *their* mouths, "Easy on the Chinese dried eggs, Demetrios." Of course, if you're a moral coward like me you may prefer to do most of it by correspondence, but it's not so effective.

* * *

Janis lay on the couch in outpatients. Just three weeks old, this was her first attendance; treatment for her club foot had started in the maternity ward. In her mouth lay a nice fat dummy. "Who suggested that?" I asked. "Dr. S." said Janis's mother. I rashly told her that our four had all done very nicely, and had never seen a dummy. But she had the last word. "Dr. S. has five and they all sucked a dummy."

* * *

The age of six seems to be gifted with peculiar penetration. After a particularly busy day of much documentation, I mentioned to my twins of that age that I had signed my name "hundreds of times" on pieces of paper. A few days later my reputation was finally blasted by their answer to the inquiry of a new acquaintance: "Oh, Daddy's a doctor on paper."

Letters to the Editor

SEQUELS TO ANÆSTHESIA

SIR,—I think that it is high time that an advocate of nitrous oxide should reply to the criticisms which my friend Dr. Bourne implies in his letters to you on that well-tried anæsthetic agent, nitrous oxide.

It is extremely unfortunate that Dr. Bourne's letter of Aug. 6 should have been noticed in the lay press; here, the impression is given that nitrous oxide is a very dangerous agent; further, this impression has been strengthened by the remarks of Dr. Bedford (Aug. 6):

"The occasional catastrophic effects of anoxia during nitrous-oxide anæsthesia have been vigorously emphasised, by Courville (1939) and Bourne (1952) among others. Yet in spite of the condemnatory evidence *nitrous oxide is still widely used.*" (The italics are mine.)

Of course it is still widely used, and the reasons are obvious; but, before we consider the reasons for its continued use, let us analyse one or two of the "accidents" which Dr. Bourne mentions in his letter.

CASE 2.—A healthy woman of 35 has an uneventful gas but becomes hysterical afterwards. Screaming hysteria is a frequent concomitant of suboxygenation, and, although distressing, is quite harmless. Persons rescued from mines filled with "choke damp" often are hysterical when brought to the surface. Dr. Bourne should read his history; both Beddoes (1799) and Davy (1800) report cases of hysteria after the prolonged inhalation of nitrous oxide.

CASE 3.—A child aged 3 years 9 months did not recover consciousness for one hour and three-quarters after having one tooth removed. I will hazard a guess that she had been in pain and had not slept for two nights. This was deep natural sleep, which is often observed in these circumstances and which is, indeed, rather more frequent after the old-fashioned ethyl chloride.

CASE 4.—A man aged 27, anæsthetised with gas, oxygen, and trichloroethylene, became slate-grey. A clear case of vagal inhibition due to trichloroethylene.

CASE 5.—A strapping girl of 18 went into hysterical convulsions. See case 2.

CASE 6.—A 4-year-old boy was given nitrous oxide and oxygen. "Breathing almost ceased, pulse a very faint flutter. Artificial respiration instituted with oxygen, pink colour of skin returned immediately." Exactly. He was nearly killed by a badly given gas, which resulted in gross hypoxia, but was restored by means of oxygen and artificial respiration.

It is obvious that no-one can be didactic without having personal knowledge of these cases. Apparently, Dr. Bourne has no personal knowledge of them, and therefore my "bet" is as good as his. Dr. Bourne has produced no evidence to show that any of these mishaps were due to nitrous oxide per se. Three were due to hypoxia as a result of a faulty technique; one was due to pain and sleeplessness; one was due to trichloroethylene, or possibly to an unrelated vaso-vagal attack.

We now come to the reason why nitrous oxide is still used in spite of Dr. Bourne, Dr. Bedford, your own editorial, and the editor of the *Daily Express*. It is because nitrous oxide remains the safest of all anæsthetics in minor surgery. Figures can be made to lie, but certain facts are incontrovertible. It so happens that I am connected with two of the major dental schools in London—those of King's College Hospital and University College Hospital. In these two schools, there has only been one death during the past thirty years in the dental-gas room; the post-mortem findings showed that this was due to a fractured sternum and several ribs, which suggests to me that resuscitation may have played some part in the fatality. During this period of thirty years, the gases have been administered by dental students, medical students, and newly qualified housemen; it is true that someone skilled has usually been in charge, but not always. I myself have given dental anæsthetics for at least two "sessions" a week during the last twenty years; and during this time, I have been frequently frightened almost out of my wits by empty oxygen cylinders; by students dreaming away while the patient goes steadily black in the face; by throat packs thrust down into the trachea; by mothers who state that their little darlings have had nothing to eat when, in fact, they have had a large breakfast an hour beforehand. Yet, during these twenty years I have never seen or had personal knowledge of a case of cerebral damage or prolonged "coma"; I have never had to perform a tracheostomy or even had to give artificial respiration.

In the present state of anæsthetic techniques, there is no other anæsthetic agent which can give such a factor of safety as this. He who tries to replace nitrous oxide in dentistry by any other known agent is doing a grave disservice to the safety of anæsthesia.

Yet, as Ralph Waters once said, "Freedom from pain is always bought at a price." There is no doubt that the unskilled administration of nitrous oxide may occasionally be dangerous by reason of the cerebral anoxia which such lack of skill may produce. But this is not the fault of nitrous oxide; it is the fault of our teaching of anæsthetics. Most dental gases are administered by dental surgeons; the average dental surgeon complains, quite justifiably, that he cannot obtain the services of a doctor who can give a good dental gas. So he gives these gases himself, and he becomes an extremely competent technician. But he is still only a technician; if he is faced with a crisis, he is not competent to deal with it. The danger of nitrous oxide lies in its safety; so rarely do these crises occur that the average dental surgeon cannot possibly gain any experience in coping with them.

The remedy lies in the reorientation of the teaching of anæsthetics. The medical student spends far too much of his time in the operating-theatre, learning techniques which properly belong to the province of the specialist and which will be of little or no use to him in his practice. He should spend the greater part of his anæsthetic course in the outpatient surgery and the dental-gas room, learning simple and safe methods of anæsthesia from skilled teachers. No student should be permitted to qualify without being able to administer such an anæsthetic.

As a natural corollary, dental students should no longer be permitted to administer, or be taught to give, dental anæsthetics. Only thus can the technician be replaced by the anæsthetist.

Otford Kent. F. F. CARTWRIGHT.

SIR,—Your leading article and Dr. Bedford's paper require comment on similar grounds.

It is loose talk to refer to the dangers of nitrous oxide when you surely mean to speak of the anoxia which occurs when it is given with insufficient oxygen to support normal tissue requirements. You hint darkly that nitrous oxide may be a common factor in the post-operative dementias described by Dr. Bedford (p. 279, "It is not entirely clear whether nitrous oxide was administered in all the cases of postoperative dementia described by Dr. Bedford, but apparently it was often used."), and then you go on to recommend that nitrous oxide should be denied to the elderly patient. It would be as reasonable to deny us the air we breathe because many people die breathing it, or because nitrogen, placed there by the Creator, is dangerous if inhaled in asphyxial concentrations.

Dr. Bedford is on safe ground when he warns against uncontrolled hypotension in the elderly. But he flaunts his prejudices a little boldly when he extends his warnings to a general attack upon the techniques of controlled hypotension as being "unjustifiable in people of any age-group." In his case-histories, anæsthesia and hypotension

are invoked as the chief causes of the postoperative dementia; but other possibilities such as fat embolism, air embolism from open prostatic veins, the intrinsic hazards of a steep Trendelenburg position, and aspiration asphyxia are either scarcely mentioned or ignored. Thus, case 2 is described as having a normal blood-pressure of 150/80, and collapsing when his blood-pressure fell to 80/60. Now, patients with a normal blood-pressure of 150/80 do not collapse because their blood-pressure settles to 80/60 (I have walked about with a systolic pressure of 70 mm. Hg, induced experimentally, in no great discomfort, and my electro-encephalogram remained normal during a ten-minute period with the systolic pressure at 80). One is led to suspect that the real cause of the trouble in case 2 remained undetected, or at any rate unreported.

If Dr. Bedford would carry his studies to the operating-room he would see that controlled hypotension has an ambivalent appeal to our emotions. Hypotension, like any other powerful weapon, is fearful if abused or uncontrolled, but when properly used it also claims our respect for its value to the patient. Through controlled hypotension the difficult or impossible can be made possible, blood is saved, and in cases of left-ventricular strain or cor pulmonale pulmonary ventilation is increased and breathing made more tranquil.[1]

Certain of Dr. Bedford's remarks about hypotension are quite justified. He is entirely right about the need for further research into the safe limits of controlled hypotension, but such research entails the use of expensive recording apparatus which is all too rare in this country. One could also concur that hypotension should probably not be sought too actively in the elderly, on the grounds that it is seldom needed in these patients. Blood does not flow so wildly in the old as in the young, as Seneca indicates in Pyrrhus's tidy butchery of Priam,

> Vidi, vidi, senis in jugulo,
> Telum Pyrrhi vix exiguo
> Sanguine tingi.[2]

—the operator was not troubled by much bleeding.

Chichester. P. R. BROMAGE.

SIR,—It is a pity that Dr. Bedford should have marred his otherwise excellent article by presuming to go into the merits of nitrous oxide as an anæsthetic. He is guilty (as is your leader on this point) of an unfortunately all too common example of muddled thinking. Nitrous oxide used as a primary anæsthetic—e.g., in dental outpatients—is harmful only in so far as less than 20% oxygen is used with it. In other words it is anoxia that is deleterious not nitrous oxide. As used in modern anæsthesia as an adjuvant to thiopentone and relaxants it is given with 25–30% oxygen, and this technique is in the main responsible for the great advances in surgery—abdominal, thoracic, cranial, and geriatric—during the last fifteen years.

I shall go further and state that it would have been far better if Dr. Bedford had assessed the cases where histotoxic poisons like ether and trichloroethylene had been used on the one hand and nitrous oxide/oxygen on the other.

Another point, I am afraid, is that no-one is above reproach—least of all the modern anæsthetist. Dr. Bedford does not state how many of his cases were anæsthetised, under emergency conditions, by inexperienced residents who may have shared his misconceptions on nitrous oxide.

Otherwise Dr. Bedford is to be commended for once again drawing the attention of all to the meticulous care bad-risk cases ought to receive—adequate preoperative preparation, full hydration, and replacement of blood-loss. The last seems to be an all too frequent omission after prostatic operations. In addition proper post-operative care is essential: sedatives are still too often prescribed for anoxic restlessness, and perhaps the greatest pitfall of all is the way shocked patients are propped up in bed by an over-zealous but misguided nursing staff, thereby cutting off the last vestige of blood-supply from the already gasping cortical cells.

St. Bartholomew's Hospital, Rochester, Kent. P. G. AZZOPARDI.

SIR,—Dr. Bedford has established that cerebral anoxia is a bad thing and especially bad in old people. This is well appreciated by anæsthetists. What he has not, I think, established is that the cerebral deterioration in old people which sometimes follows accidents, surgical trauma, or even hospitalisation is due to general anæsthesia properly administered.

In the 18 cases he cites it is difficult to decide what part, if any, general anæsthesia played in the production of dementia; for adequate anæsthetic details are not given.

Turning to your leading article on the same subject I am surprised, Sir, at your dogmatic condemnation of nitrous oxide. That unpleasant sequelæ may follow the administration of gas or gas-and-oxygen in the dental chair has been shown by Dr. Bourne. But this type of administration is frequently "controlled asphyxia" rather than anæsthesia. To inhale a mixture containing only 5% or 10% oxygen must inevitably cause cerebral anoxia. Nitrous oxide combined with 25% to 50% oxygen is quite a different matter.

Hastings. P. DUNBAR JOHNSON.

SIR,—I write to request you to remove your edict on nitrous oxide (Aug. 6). Why not forbid thiopentone, which is the only anæsthetic agent common to all the cases on which you launch your strictures? It is a great deal more likely that the damage is caused by the hypotension which follows the induction with thiopentone than by a little weak nitrous oxide.

In any case dogma is not appreciated, as witness what I heard in the theatre yesterday:

SURGEON: "What are you giving?"
ANÆSTHETIST: "Only gas."
SURGEON: "Nothing that will explode?"
REGISTRAR: "Only the Editor of *The Lancet*."

Gloucester Royal Infirmary, Gloucester. J. SHEGOG RUDDELL.

SIR,—The danger of cerebral damage from anoxia in elderly patients undergoing operations under general anæsthesia is a very real one. But neither in Dr. Bedford's excellent article nor in your leading article is there any mention of a very simple solution—namely, to perform the operation under regional analgesia. Any part of the body is capable of being rendered insensible to pain by modern analgesic technique, and the omission of all reference to this is surprising. The condition of an elderly man, for example, undergoing prostatectomy under a regional block, is very much better than under general anæsthesia; and provided that care is taken to maintain the blood-pressure at normal level, no harm whatever can come to the cerebral cortex.

And, in my opinion, the general well-being of these patients is in some measure due to the fact that they are breathing air, and not some vapour of doubtful oxygen content from an anæsthetic machine. It has always seemed strange to me that the modern anæsthetist does his utmost to exclude from the patient the mixture of gases which he is physiologically best adapted to breathe—air.

London, W.1. MASSEY DAWKINS.

SIR,—On reading Dr. Bourne's interesting letter of Aug. 6 on Dental Gas and Cerebral Palsy I am prompted to relate my experiences albeit on a much smaller scale.

1. Bromage, P. R. Awaiting publication.
2. Seneca, Agamemnon, 1, 656.

I commenced giving gas-and-oxygen for a school dental clinic in March of this year, and at a rough estimate I dealt with about 15 children at each session every two weeks, up to the school holidays. Out of all those children there was only one that made me think that my technique required overhauling :

A girl under school age took her gas without any trouble, and the tooth was extracted. But afterwards, instead of a healthy crying child, we had one who was quite stuporose, could be roused only with great difficulty, and eventually had to be taken out into the open air. I was informed that it was about an hour before the mother was able to take her home.

I assumed all this had been due to an error on my part or to some impurity in the nitrous oxide ; but after reading Dr. Bourne's letter I feel that the whole subject is worthy of further investigation by the powers that be.

Rickmansworth. A. I. BARRON.

THE "WRONG" HOSPITAL

SIR,—Your leading article of July 30 is a timely reminder that the general hospital is the mainstay of the hospital service. Yet there are many administrators, both medical and lay, whose tidy but short-sighted minds consider that the dismemberment of general hospitals, by putting the various specialties in separate buildings scattered over a large area, is good planning. If such planning is allowed to continue, there will be an increasing number of reports in the lay press of patients being sent to the wrong hospital ; for this regimentation encourages overspecialisation and the treatment of a disease rather than a patient.

In one group of hospitals, the main "general" hospital of the group has been without its medical beds (apart from pædiatrics) since the war. Because of bomb damage, these medical beds are housed in another building altogether, some distance away. Rather than restore the damaged wing and thereby the medical beds, the authorities are said to contemplate moving other special departments (such as obstetrics or pædiatrics) out of the "general" hospital to another building to make room for general medical patients—a process of robbing Peter to pay Paul which would leave the general hospital without the benefits of these specialised departments.

A general hospital benefits by having its specialised departments, just as the department benefits by having the services of the "general" hospital. Perhaps in no department is this more important than the obstetric wing ; for here we have two patients, both mother and babe, who may need the services of the general surgeon or physician as well as those of other specialists and the ancillary services that a "general" hospital can supply.

London, W.1. H. H. FOURACRE BARNS.

LABORATORY TECHNOLOGISTS

SIR,—The conditions of service of many sections of the hospital staffs of this country have been mentioned many times in your journal over the past few years. Whilst we have often felt that the case of medical-laboratory technologists should be brought to notice we have, up to now, refrained from doing so in the vain hope that conditions would improve and render such action unnecessary.

Since the inception of the National Health Service over 700 trained technologists have left the service and the main reasons for their doing so have been those of poor salary and status. Many have become commercial travellers and, whilst this may be of great advantage to the commercial interests which they represent, it means that the hospitals have suffered a grievous loss of trained people which can only be regarded with horror, especially as some of these people had devoted the greater part of their working life to the service of pathology.

Whitley Council negotiations on these matters appear to go on for ever but never seem to arrive at a satisfactory conclusion. One is forced to wonder whether this method of discussion will ever be successful or whether it will continue until all the trained technologists have left the hospitals and a generation of unenthusiastic and unskilled bottle-washers breeds in the resultant financially stagnant waters of the impoverished pathological laboratories of the National Health Service.

F. RAMSDEN
J. B. WRIGHT
Group Laboratory, Royal Infirmary, Preston. J. H. WILKINSON.

OUTBREAK AT THE ROYAL FREE

SIR,—I was most interested to read in your columns the announcement from the Royal Free Hospital about the outbreak of an obscure infection involving the nervous system. The description is similar in many ways to that of a much smaller but no less puzzling outbreak at the Middlesex Hospital in 1952 [1] and to a lesser extent to those reported from Iceland,[2] Adelaide,[3] Coventry,[4] New York,[5] and Durban,[6] in the last six years. Including the current epidemic no less than four of these have commenced in nurses' homes. All have struck when poliomyelitis was prevalent, and they have been remarkable for the absence of mortality, the rarity of changes in the cerebrospinal fluid, the relatively prolonged active course of the disease, and the failure to isolate any known causal organism. (A.P.M. virus, type 3, was isolated in 1 of the Middlesex cases.[1])

Sensory symptoms and signs, retention of urine, low or absent fever, and marked muscular pain and spasm, often in the presence of pyramidal signs, are additional features which on the present evidence seem to be shared by the Royal Free and Middlesex Hospital patients. Normal lumbar puncture is a striking feature of both.

The major difference between the present outbreak and the others already referred to is the evidence of involvement of the lymph-nodes, liver, and spleen. (I have no detailed information about the Durban epidemic.) For this reason, I have rescrutinised the Middlesex case-histories. The following facts were not then considered sufficiently important to abstract for publication :

Enlargement of lymph-nodes (anterior triangle of neck) 2 cases.
Ulcers in the mouth 1.
Herpetiform lesions on the lips 2.
Enlargement of the liver and spleen was not detected.

White-cell Counts (performed in 6 out of 14 cases)

Case	*Total*	*Neutrophils* (%)	*Lymphocytes* (%)	*Monocytes* (%)	*Eosinophils* (%)	*Basophils* (%)
1	4800	54	39	7	0	0
10	11,400	81	15	4	0	0
11	7900	55	34	11	0	0
12	7700	66	25	9	0	0
13	10,900	69	27	4	0	0
14	6900	36	51	7	6	0

Paul Bunnell Tests (4 cases)

Case	*Titre*
10	1 in 7
12	Sept. 11, 1952, 1 in 56 ; Sept. 18, 1952, 1 in 14
13	1 in 7
14	1 in 7

It is interesting to speculate how far the initial clinical diagnostic bias colours the observations which may later be made in an obscure outbreak of this sort. Our original bias was in favour of poliomyelitis or Bornholm disease rather than glandular fever. We were, therefore, not surprised to find marked tenderness under the costal margins in 3 cases (as reported also in the current outbreak), with additional pleuritic pain and tenderness over the lower ribs in 5 others.[1] Rightly or wrongly,

1. Acheson, E. D. *Lancet*, 1954, ii, 1044 ; see also editorial, p. 1060.
2. Sigurdsson, B., Sigurjonsson, J., Sigurdsson, J., Thorbelsson, J., Gudmundsson, K. R. *Amer. J. Hyg.* 1950, **52**, 222.
3. Pellow, R. A. A. *Med. J. Aust.* 1951, i, 944.
4. Macrae, A. D., Galpine, J. F. *Lancet*, 1954, ii, 350.
5. White, D. N., Burtch, R. B. *Neurology*, 1954, **4**, 506.
6. Hill, R. W. Personal communication.

the possibility of a tender, enlarged, but impalpable spleen or liver was not entertained in our series, and the slight and variable changes in the white cells noted above were discounted.

The solution of the identity of these recent outbreaks and of their relationship to one another (if any) and to the recognised types of encephalomyelitis must come from the laboratory worker. The time is surely ripe for a major assault on the problem.

London, W.1. E. D. ACHESON.

METABOLIC RESPONSE TO ADRENALECTOMY

SIR,—I am pleased that Dr. Robson and his colleagues (Aug. 13) have confirmed my conclusions[1] on the metabolic response to adrenalectomy. The studies I performed on a series of patients undergoing total adrenalectomy were designed to test the validity of Ingle's concept of the "permissive" rôle of the adrenal cortex. These studies showed that the initial postoperative loss of nitrogen and retention of sodium was followed by a phase of sodium loss and a return of the nitrogen balance to preoperative levels. This biphasic metabolic response is typical of patients with intact adrenals undergoing surgery. The constant daily dose of cortisone acetate was 80 mg., which proved adequate for satisfactory clinical recovery from operation. I suggest that if Dr. Robson's study had been prolonged beyond the initial postoperative phase the later changes in metabolism might reflect the action of the high dose of cortisone rather than the response to operation.

The London Hospital, E.1. A. STUART MASON.

A RARE DISEASE WITH FEATURES RESEMBLING BOTH RHEUMATOID ARTHRITIS AND A LIPOID ACCUMULATION

SIR,—If I were to attempt to describe any one of the few known cases which I have in mind I should take up much room and give a very incomplete picture of a disease, the existence of which I should like to be able to prove. I must therefore content myself with giving a general outline of the most striking features.

An adult man of early middle age complains of symptoms resembling rheumatoid arthritis, probably with moderate fever, and cutaneous or subcutaneous nodules appear, which do not tally with the descriptions of the well-known necrobiotic granulomata of rheumatoid arthritis. Biopsy examination shows that the collagen fibres in the cutis are separated by large cells resembling histiocytes and larger cells, like foreign-body giant-cells or the multinucleated cells of Gaucher's disease or ganglion-neuroma. But by special staining there is no evidence of nerve fibrils in the nodules to suggest ganglion-neuroma.

Besides the larger swellings an eruption of small superficial miliary "droplets" may appear on the face. The application of warmth seems to favour the production of the swellings, which may coalesce at the back of the neck and shoulders where the warmth is increased by lying on soft pillows.

In a case studied by Freudenthal and Parkes Weber,[2] Freudenthal found that the cytoplasm of some of the giant-cells gave a faint reddish tinge with Sudan III. He suggested that the cells in question might be regarded as "prexanthoma" cells destined ultimately to become foam-cells.

The patient in question, who received dietetic and other treatment (exact records lost through enemy action) at the Middlesex Hospital during the second world war, slowly improved, and when I saw him in November, 1943, the swellings had been largely reabsorbed, and he could walk about well and do night-watching, though he could not flex his right hip normally. He still had knotty, rheumatoid hands with nodules at the knuckles and over the elbows. There was also a good deal of crackling when he flexed and extended his knee-joints. I found him still better in 1947.

In a fatal case, which I regard as of the same nature, and which I was allowed to see occasionally, the front wall of the chest collapsed towards the end.[3] Other cases I have referred to elsewhere.[4]

The references quoted by Davies and Wood,[5] in their illuminating paper entitled The So-called Reticulohistiocytoma of the Skin, throw much light on the subject.

On the whole I suggest that the case of Freudenthal and Weber was a new syndrome of a rheumatoid condition combined with a metabolic lipoid disorder in which the accumulating lipoid was of somewhat similar nature to the kerasin of Gaucher cells.

London, N.W.1. F. PARKES WEBER.

THE DEATH PENALTY

SIR,—Sir Francis Walshe takes you to task, in his letter of July 30, for using "emotive language." But if emotive language will help towards doing away with this butchery, let us have more and more of it. Major Lloyd-George has said that he will reconsider abolition when there is "overwhelming public *sentiment*" in favour of such a step. If you, Sir, in your "emotive" editorial, have contributed towards building up that sentiment, then you may well be satisfied.

In the same issue, Dr. Webster salves his conscience by hiding behind the phrase "courts are courts of law not courts of morals." But that is precisely the terrible thing about British law. We are in the grip of a robot-like inhuman automaton. The button is pressed and the dial shows *death*. Instead of judges, might it not be better to substitute electronic brains? At least the judges would then be spared the "ordeal" they often complain of. Surely, Sir, the law was made for man, not man for the law. And the law is supposed to be interpreted by human beings, not machines.

Dr. Piney (July 30) also has a neat way of evading the issue, a way that does credit to us as a nation of horse and dog lovers. "Put the poor creatures out of their misery," he says in effect. No doubt he thinks it unfortunate that doctors have not quite the same powers as veterinary surgeons. It would be as logical to recommend that all animals serving life sentences in the zoo should be put to death, and, as a next step, euthanasia for everybody in Broadmoor. Actually, in the case of Ruth Ellis, it appears possible that she did welcome death and might have committed suicide if given a chance—and most of us hope that this mercifully was the case. But it is no excuse for us to aid and abet suicides by providing a qualified hangman for the purpose.

We cannot make excuses for death under any guise. Do not let us try.

Geneva. W. NORMAN TAYLOR.

SIR,—Fully appreciative of my deep personal indebtedness to Sir Francis Walshe, I cannot allow his forthright remarks to go unchallenged. My qualification?—that of a student of human "normality" centred upon an area immediately adjacent to Holloway gaol. Those who demonstrated outside the prison on the Tuesday before the execution of Ruth Ellis had not taken much personal action beforehand because, until the day before, there had been a general feeling that she would be reprieved. But I have no doubt that most of the demonstrators were sickened by the impending execution.

By the highest standards Ruth Ellis may have been a "worthless" woman; but she had been living with a man with whom she was in love, and a few weeks before

1. Mason, A. S. *Lancet* (in the press).
2. Parkes Weber, F., Freudenthal, W. *Brit. J. Derm.* 1937, **30**, 522.
3. Graham, G., Stansfeld, A. G. *J. Path. Bact.* 1946, **58**, 545.
4. Parkes Weber, F. *In* Modern Trends in Dermatology. London, 1948; p. 309.
5. Davies, B. T., Wood, S. R. *Brit. J. Derm.* 1955, **67**, 205.

the murder she had had a miscarriage. Acutely agitated she decided on violent action; and, since she was a woman and physically inferior, this could be effective only with the use of an instrument. The form of violence she chose required little physical strength but easily resulted in death. But *ira furor brevis est*; and afterwards, because of her depression and desire to die, she actually assisted towards her own liquidation. Here then was murder followed by what was tantamount to suicide—while the balance of her mind was disturbed. It was disturbed because of a severe psychological trauma suffered by an acutely unstable woman after a recent miscarriage. In almost any other country in the world she would have been shown sympathy and understanding. It is the custom to do so in this country where a mother is involved in the death of an infant.

Bad though it may be for a child to know that his mother is in prison for killing someone who had wronged her, there is a world of difference between this and knowing that his mother has been hanged. I have knowledge of only one reprieved murderess. She, after serving a life sentence (minus remissions for good conduct), is now doing a useful day's work. But professional contact with a local hostel for youths from broken homes makes me suggest that it will be little short of a miracle if the ill effects upon Mrs. Ellis's older child are not deep and permanent. The labour involved to prevent them may be enormous. "Off the record" conversations with magistrates of children's courts, probation officers, and a governor of a borstal institution would perhaps give one some idea of the potentialities of the situation.

And what about some of the gruesome technicalities of the hanging? They must surely cause a further hatred of society in other prisoners already warped in mind and soul. They include the scrutiny of an individual for height, weight, and bodily configuration; the sounds made the day beforehand, each time the "ceremony is rehearsed"; and the changing into canvas underclothing by the condemned woman on the morning of the execution. All these add to the barbarism of the hanging. This is followed by an inquest—to *inquire* into the *cause* of death—somewhat redundant, one would have thought. Lastly the notice is (or was) posted outside. Much has been made of this. There is little wrong in society publicising an outrage it has committed. The crime lies in committing the outrage.

One of my patients commenting on the hanging told me that something foul had been done for which he felt himself partly to blame. Others, with equal feelings of revulsion, showed less dignity. *Delicta maiorum immeritus lues.*

London, N.7. I. H. MILNER.

SIR,—No-one is more appreciated for the accuracy of his aim and the penetrating power of his criticism than Sir Francis Walshe, but he was sadly off form in his letter of July 30. How could he say that you invited us to believe that Mrs. Ellis's execution deprived her children of normal home life when you clearly wrote: "The children, who must inevitably be deprived of the 'normal home life' of which we nowadays speak so glibly, have been dealt, in addition, a most shattering psychological blow."

Surely he can see that it is devastating for a child to grow up with the knowledge that Society, Authority, the State, call it what you will, after careful deliberation, decided to kill his mother? I agree with the Editor of *The Observer* who told his readers that each one of them shared the responsibility for these hangings, and I feel, Sir, that you should have told your readers that their responsibility is 1000 times that of the general public. For of the three professions directly concerned in judicial hanging, the Church seems indifferent, the bishops being content to leave the delicate duty of reconciling the teachings of Christ with their blessing on the hangman's labour to the prison chaplains; and the Law as always places legality before justice. Medicine alone offers hope.

For not only have we the public's ear on every aspect of behaviour but no man can be hanged unless a doctor explicitly or implicitly certifies him sane. And none of us can be compelled to give our opinion unless we choose to do so.

The extraordinary thing about this correspondence is that Sir Francis appears to put himself on the hangman's side. Yet, one needs to have come no nearer than the back row of one of his clinical demonstrations to know that he is a physician of the greatest understanding and humanity. It is impossible to imagine him having the care of a condemned man and then, on the appointed day, handing him over to the executioner.

The reason for the persistence of this barbarous practice lies, I suggest, in overspecialisation which has reduced each individual's responsibility to a tolerable fraction. The prosecutor, juryman, judge, doctor, and hangman each does his part, though none surely could be found willing to do the whole.

We can most easily break the chain: therefore our responsibility is the greatest.

Droitwich. J. F. TUTHILL.

SIR,—Sir Francis Walshe is severely critical of those who oppose capital punishment and he accuses them of emotionalism, but one searches in vain for a single rational argument to justify capital punishment in his two letters, which occupy over 120 lines of your valuable space.

All moral systems include some such principle as "Thou shalt not kill." However, in the past, governments have found it "expedient" to make exceptions under certain circumstances. For instance, in war-time we are instructed to murder our fellow creatures in as large numbers as possible. When there is a revolution, the government considers it highly moral to annihilate the "rebels." (Of course, the rebels consider this highly immoral.) If a citizen commits a murder, the State does not consider it immoral to murder him by hanging—presumably on the primitive principle of "eye for eye" and "tooth for tooth." The latest demand for more sanctions to murder comes from the euthanasia enthusiasts, who would have us kill human beings with their consent (e.g., cancer sufferers, and psychotics who express suicidal desires), and also without their consent (e.g., imbeciles, idiots, and dements). The ethical question is, should there be any exceptions to the Sixth Commandment? It does not require a meticulous study of the history of philosophy during the past two thousand years to give an answer, as Sir Francis Walshe would seem to imply. The answer should obviously be in the negative, and it is indeed a terrible indictment of our low level of ethical development that we should still be debating this question.

Park Prewett Hospital, Basingstoke. I. ATKIN.

Public Health

Poliomyelitis

IN the week ending Aug. 6, uncorrected notifications of poliomyelitis in England and Wales totalled 307 (paralytic 146, non-paralytic 161). In the preceding week the total was 241 (paralytic 121, non-paralytic 120). The continued increase in notifications has been fairly general throughout the country, but the rates in the following places have been decidedly above average: Barnsley, Hoyland Nether (West Riding), Dover, Stepney, Willesden, Poplar, and Thurrock. So far this has been an average year for poliomyelitis, but the situation is still confused owing to the unusually large proportion of non-paralytic cases. Some of these may be aseptic meningitis not due to poliomyelitis virus.

Obituary

THOMAS JEEVES HORDER

BARON HORDER OF ASHFORD

Bt., G.C.V.O., M.D., B.Sc. Lond., D.C.L., F.R.C.P.

IN the old days, before specialisation got under way, there were always two or three physicians and surgeons whom their colleagues and the public regarded as a final opinion in case of doubt or a last hope in desperate straits. Lord Horder, on medical merit, was already reaching this eminence in the reign of Edward VII, and his name has been a household word as long as most people can remember. With his peculiar conjunction of sagacity, audacity, and humanity, and his immense knowledge, he had become a legend; but until his brief illness last Saturday the legend has had to compete with a very real person, living very much in the present. A great many of us will personally miss his wisdom, his fun, and his thoughtfulness.

He was born at Shaftesbury, Dorset, in 1871; but his father, who was a draper, moved with his family the following year to Swindon, where Horder spent his early years. His formal education began at University College, and in 1893 he graduated B.SC. with first-class honours in physiology. He continued his medical studies at St. Bartholomew's Hospital and qualified in 1896. Two years later he took his M.B. with first-class honours and carried off gold medals in medicine, midwifery, and forensic medicine. These early successes would have strengthened and confirmed many men in their choice of a career. But Horder later confessed to an audience of students his own continuing uncertainty.

"I still sometimes wake in the night," he said, "in what is called—perhaps with more expressiveness than actual truth—'a cold sweat,' and with a sense of panic lest I may have missed my vocation. And I have, even yet, never quite forgiven Fate for denying me, what at the time I thought so essential, the leisure and the opportunity of thinking out, fully and carefully, the pros and cons of the profession into which I was, as it were, inveigled. I remember how fearfully and tentatively I approached the final decision. I dallied first with biology, then with physiology, teaching both of these subjects before finally committing myself. Then, when the step was at last taken, I remember the qualms and the doubts that assailed me."

But whatever his inward doubts, his outward course was resolute and effective. After holding house-appointments at St. Bartholomew's Hospital and Great Ormond Street he received his first honorary appointments when he joined the staff of the Great Northern Hospital in 1900 and the Cancer Hospital, Fulham, in 1906. He quickly built up a considerable consulting practice, and when he was still a registrar at Barts he was able to afford a Rolls-Royce—which, however, he was in the habit of diplomatically parking a few streets away.

The reputation he had established even before his appointment to the staff in 1912 was based largely on his appreciation of the importance of pathology for clinical medicine. He was in fact a pioneer in clinical pathology. When accused of having deserted the bedside for the laboratory, he answered "on the contrary, I have taken the laboratory to the bedside." "Horder's box," which became the talk of the town, contained test-tubes, culture tubes, blood-counting apparatus, and blood-culture syringe. One of his first important textbooks, *Clinical Pathology in Medicine* (1910), summarised this side of his work.

At this period the infective diseases were his main interest, and most of his research was done in this field. He was the first to cultivate streptococci from the blood in a case of infective endocarditis, and he also helped his friend Mervyn Gordon in his classification of the streptococci and later in his studies on lymphadenoma.

But it was as a clinician that Horder was supreme.

When at the bedside it was his custom to remain quietly seated, and he would often hold the patient's hand. While the patient talked, he would look and stare at the hand very much like a palmist; but with his experienced clinical eye he would gather a great deal about the patient without him realising it. The questions were always concise, clear, and consecutive, building up stage by stage through the history a likely diagnosis and a forecast of what the examination would reveal.

He was gentle in his inquiries, and he would probe into the inner self of the person with all delicacy. He would be equally gentle in his examination, and there would be little of the machine in the examination. When the examination was over, the consultation would remain incomplete until the patient and he saw the situation with the same eyes. The understanding between him and the patient would have to be a reality before there could be any discussion on treatment. Diagnosis, and that the correct one, was the first step; and to its problems he brought unusual powers of rapid and accurate assessment both of persons and situations, extensive information stored in a singularly retentive memory, and a balanced judgment. He had absorbed the knowledge of Samuel Gee, whom he greatly admired, and added his own genius to it.

Not all great physicians have been great teachers, but Horder was both. With him Barts always came first, even in the early '30s when he was at the peak of his fame. High officers of State, diplomats, or visiting Royalty might command his attention over the luncheon-table, but they could not keep him from his teaching round and that invariable visit to the post-mortem room which preceded it.

His success as a teacher lay partly in the simplicity of his remarks. Speaking slowly, he would direct his pupils' attention to essentials, whether in the anamnesis, the examination, or the writing-up of notes. Legibly written, orderly, and concise, his "front pages" must have served as a model for thousands of doctors. You were never confused with a plethora of detail. Clinical medicine, in fact, seemed easy if you were with Horder. It was open to everyone, he held, to take a perfect history and complete the physical examination: skill lay in differential diagnosis and in prognosis, and here his aphorisms were invaluable. What a wealth of experience lay behind that remarkably compact little volume

Medical Notes—as trim and precise as himself! On the round he geared himself down to the mental pace of the student, with the result that a visitor might be deceived by the slowness of his delivery and of his methodical approach.

The basic rules of clinical medicine were emphasised at each bedside: "inspection before palpation, please," he would say, "let us see how far we can get with inspection alone." And so a frail-looking child was undressed for us to observe the pallor, the excursions of an enlarged spleen against a thinned abdominal wall, and the swollen lymph-nodes in the neck and groins: the presence of sinister livid patches on the skin served to complete the diagnosis which the blood-count soon confirmed. He taught characteristically by quizzing the student. "Have you excluded *lues*?" he would ask. "Yes, sir," would be the reply. "Good"; and then in a series of searching supplementary questions he would attempt to shake the man's confidence: "no scars or syphilides?" "even at the back of the neck?" "no glossitis?" "not even a little patch far back?" "Are his epitrochlear glands palpable?" "did you look to see if he had a scar of a primary?" "vibration sense intact?" "Are you sure he hasn't a small popliteal aneurysm?" "have you felt?" Sooner or later the unfortunate would admit "I am afraid I forgot that one, sir." "Oh," he would reply—and then one might discern that momentary but carefully concealed look of impish delight in having scored his point—"but you mustn't overlook important evidence, you know, even of a negative kind"; and in this way, while trying to earn his confidence, student and houseman learned to search for circumstantial evidence of disease. To reply to his initial question by saying that the Wassermann reaction was negative would be to invite such a homily on the fallaciousness of the laboratory as told of first-hand knowledge of the subject. At other times he might say: "Will you really place so much importance on a raised protein value? Perhaps the standards have faded or maybe they have reported on the wrong specimen." Similarly, a slightly raised cell-count in the cerebrospinal fluid might excite his interest: "Are you sure they weren't red corpuscles which have taken the stain?" Though himself an able pathologist, he used the laboratory only to supplement or confirm his clinical senses and never to usurp their rightful place in diagnosis. He would write up "enteric fever" on the bed-board with confidence, and then ask for the laboratory findings: "Thank you," he would say, "we can now add in brackets '*B. paratyphosum B*' and give the titre, which in this instance is diagnostic."

To work with Horder and to learn from his teaching and example was an experience greatly prized, and his juniors gave him unswerving loyalty. Forthright in his approach, and a master of the sardonic touch, he could, and did, make enemies as well as friends; but he revealed both to his patients and to his young associates a spirit of sympathy and understanding. The dinner of his former house-physicians, held on his birthday, Jan. 7, has latterly become an annual event, testifying to continued affection.

"Each year the numerous stories which surrounded his name were retold until he even believed them. His knowledge of those who had served him was boundless and to each he brought some remembrance of the past and with some twist of his own. The passage of time left little mark on him, not so his house-physicians; and at the last dinner he learned with impish joy of one who had had to decline the invitation because of advancing years."

Early in his career Horder became a doctor of other doctors, and not much later he became a doctor of kings. To both these valuable and exigent groups of patients he offered clinical wisdom and honesty. He was first called to a Royal patient when early in his career he attended King Edward VII. An astute piece of detection and diagnosis won him recognition, and he was privileged to serve four succeeding monarchs and many members of their families. For his work for the Royal House he was created K.C.V.O. in 1925 and advanced to G.C.V.O. in 1938. He also touched history through the Prime Ministers and Statesmen who were among his patients. When he once asked "who knows how much turns upon whether a Prime Minister's pipe is clean or foul, and the head of the Foreign Office has had sufficiency of sleep?" he was probably speaking from experience. Certainly he was the friend as well as the doctor of Ramsay MacDonald, and he advised Bonar Law when to lay down the Premiership.

These contacts and the deserved honours which they brought—he was knighted in 1918 and created a baron in 1933—gave him the prestige and position of an arbiter and counsellor. Representatives of the Government and of other national bodies, who were often also his friends and patients, turned to him for advice on many public questions which marched with medicine. Thus he was consulting physician to the Ministry of Pensions and chairman of the committee advising the Ministry of Labour and National Service on medical questions connected with recruitment. In the second world war he was Lord Woolton's personal adviser on medical aspects of rationing and nutrition, and after the war he represented this country at international conferences on nutrition and at the Food and Agriculture Organisation of the United Nations. He was also president of the Food Education Society.

Another important war-time task was his work as chairman of the shelter hygiene committee of the Ministries of Home Security and Health. Though already in his 70s, he insisted on making arduous tours of inspection: for as a confirmed clinician he would be content with nothing less than "bunkside" experience. A younger colleague who accompanied him to Liverpool and Manchester in January, 1941, writes:

"After the usual trying train journey of the blitz days, he arrived in Manchester, had a conference with officials, which went on during dinner, and was then asked to see the Press. 'I'd better see the shelters first,' he said, 'then I'll have something to say. Come back at midnight.' After four hours of visiting shelters in the blackout he returned to his hotel and held a wise, witty, and unhurried press conference. Next day he went on to Liverpool, Birkenhead, and Bootle, repeating the programme with the addition of a heavy blitz during the night, which he followed till dawn from the central control headquarters."

This work, too, he carried into the years of peace; for his introduction to London's underground stations in the blitz led him to yield to Lord Ashfield's persuasion to survey the health of London Transport's employees and help to organise an industrial medical service for them.

Where his interest was engaged—and he was a man of many interests—he was eager to use his wide public contacts to further medical research; and of all the many bodies with which he was associated, or which he founded, the British Empire Cancer Campaign was perhaps the nearest to his heart. He saw it develop from humble beginnings, and at his death it is one of the most powerful organisations for the support of cancer research. A friend who has shared in this work writes:

"Horder gave everything he had to the Campaign—and this was indeed a lot. First and foremost was his enthusiasm, which he communicated to all of us who came into direct contact with him. This played a very great part in the success of the Campaign, and it must be remembered that in the last year in which he presided over it, it distributed over £300,000 for research into the cancer problem. Horder chose his collaborators in the Campaign with care, and all the officers felt a direct personal allegiance to him. While not sparing himself in any way, he was certainly a strict disciplinarian with the officers, and woe betide anyone who made a slipshod report or who drew conclusions on insufficient evidence. Many times has Jevons's *Primer of Logic* been waved in the face of the vague. But even after a prolonged pasting with Jevons, the

victim would always be rehabilitated by the friendly twinkle and kindly leg-pull.

"Very senior men like Horder are usually treated with respect out of deference to what they have been in the past, but this was not so in Horder's case. Younger people knew that he was still better than they at their job and the officers of the Campaign took no steps without a full consultation with the Chairman of Grand Council."

Another campaign in which Horder took a valiant part was the fight against rheumatism; and here, too, he was insistent that victory could come only through knowledge. When the Empire Rheumatism Council was set up in 1936 he became its first chairman, and at the opening meeting he asked for a programme of comprehensive and coördinated research backed by doctors and industrialists. He took an important share in the preparation of the council's plan for national action against rheumatism. Publication was held up in 1939, but the plan was published in 1941, war or no war; for, as he said in his foreword, "considerations of humanity, of national safety and true economy plead for some immediate effort to check rheumatic disease." The plan proposed regional specialised treatment centres with a supervisory scheme for children. When he resigned from the chairmanship in 1953, he was elected emeritus chairman. With his interest in rheumatism was bound up his work for the British Association of Physical Medicine.

A citizen as well as a physician, he believed that "a doctor's training in the science and art of medicine, and the intimate human contacts that he makes, enable him to arrive at some general ideas which it is as much his duty and privilege to convey to society as it is to be the servant of society in his particular acts of diagnosis and of healing." Certainly Horder did his duty, and there was some truth in the jest once made in an after-dinner speech, that he presided over existence from its beginnings under the Family Planning Association to its end as a puff of smoke under the Cremation Society. Of the many important lay bodies dealing with social problems which he supported, the Noise Abatement League and the Cremation Society were probably his favourites.

That he gave his name and time to so many different organisations has been ascribed to his incapacity to resist a good idea. People would come to him with a plan; he would helpfully suggest how it might be improved; and before he could turn round he would find himself chairman. But the fact that he was already prominent in so many other councils, and in the public eye, may have been one reason why he never quite secured the honour he most desired, and to which his medical eminence entitled him—the presidency of the Royal College of Physicians. A second reason may have been his sometimes ill-timed criticism of colleagues. But it seems likely that he would, late in life, have been elected if his candidature had not been presented as a means of altering the college's attitude towards the coming of a National Health Service. As exponent of an alternative policy, Horder gradually differed more and more from those who sought an agreement; and eventually he saw his rôle as largely that of leader of resistance. Though some of his friends were saddened by this outcome, others felt that in his defence of professional freedom he reached almost his finest hour. In the words of one of these:

"For the last ten years of his very full life Tommy Horder devoted a great part of his never-flagging energies to the fight to save the profession to which he had dedicated his life. From the first he had detected the danger to medicine of a National scheme which threatened the freedom of medical practice and in particular the sanctity of the doctor-patient relationship. The danger was apparent to him from the moment the Beveridge report was published, and he made his voice heard in the House of Lords and elsewhere on the original Willink proposals, long before the much more bureaucratic scheme was introduced by the Socialist Minister of Health. He made it his crusade to fight the danger which he called 'the Bureau' and lost no opportunity of criticising and suggesting constructive amendments to the Bevan Bill which was placed on the statute-book with almost indecent haste in 1946.

"So it is no wonder that those who felt that there had been a capitulation by the profession in 1948 should turn to him in their distress. Lord Horder received 1700 letters from doctors and as a result the Fellowship for Freedom in Medicine was founded in November, 1948. Though he was now approaching his 78th birthday he accepted the chairmanship that was thrust upon him. He made it plain that the Fellowship would not be in any sense a breakaway from any other body. 'If and when we are confident,' he declared, 'that the B.M.A. . . . and/or the Royal Colleges accept, and carry out, the obligation to the public for which we ourselves stand, we can dissolve into thin air.'

"The Fellowship set to work under his direction to devise constructive plans of reform designed to promote the objects they had in view. Every month the executive committee met at 6.15 P.M., after the day's work in surgeries and consulting-rooms was done, and deliberated until close upon midnight. It was Lord Horder's pride that, except during his August holiday, he never missed a single meeting. He was also in great demand at Fellowship meetings in the provinces.

"He lived to see the Fellowship grow up into a healthy and respected body whose views could not be ignored. Not least among its achievements has been its contribution to the awakening of public opinion—and therefore of politicians—to the dangers of the control of a profession. If the medical profession and the public are spared the ignominy of coming under the domination of a State monopoly, if the ethical and professional freedom of the individual doctor is protected and his status preserved, it will be thanks to the leadership given by Lord Horder at a moment when doctrinaire politicians were united to destroy what centuries of tradition and selfless devotion has built up."

Opinions will continue to differ on whether Horder, as liberal and humanist and philosopher, might not more naturally have given leadership of another kind; for if he was an individualist, he was also much more. (Mr. Aneurin Bevan complained that though he had a heart of gold he had a mind of steel—and unfortunately it was the steel that the Government had to deal with.) But, to his great credit, political differences were never allowed to cloud his friendships or create animosity. Moreover, right or wrong, everything he said about medicine demanded attention. Like Burke, he had the desire—and what is more, the ability—to improve the state of things, though always coupled with the desire to conserve. He was much aware of the changes that beset us as a profession, and even before the late war he recognised that the patient will not help to save the doctor: since "the patient has seen most of the rest of his life mechanized, why not mechanize medicine?" But "when the machine becomes greater than the man, the patient perishes." While he encouraged specialists in surgical craft, he looked with sadness at the growing specialism in medicine. As firmly as he believed in the value of the family doctor being the family friend and counsellor, so also he believed that a physician should remain general in his outlook, and through this wide sight be able to contribute often in a non-medical way in improving man's lot in the field of life—life social and life national as well as life individual. Recognising that, as the doctor speaks more and more on things social, and contributes more to the life that he sees around him, he inevitably becomes a public figure, and may become a politician of one colour or another, he warned his colleagues that "for the doctor there can be no left or right; for him there is only knowledge, and a deep adherence to truth."

An international figure in medicine, he enjoyed meeting his colleagues from whatever country or climate. And sometimes his utterances would hit the headlines. When we recall the places and the times, what he said often needed courage—which he never lacked. Thus as the

guest of the Pilgrims in New York in 1936, when isolationism had its adherents and there were rumblings of war, he ended his speech in a prophetic vein :

"Granted that we in Great Britain are more vulnerable than you are here, this difference is only one of degree, and a degree that gets smaller and smaller every year when machines and chemists make security less certain, distance less protective and annihilation more easy. Detachment is folly. Isolation is suicide."

Anyone who met him, whether at the bedside, in the consulting-room, or at some public discussion or debate, encountered a singularly direct and clear-thinking mind, displaying in a most uncommon degree the quality oddly called "common sense." As consultant he eschewed "frills," suavity, and the grand manner. As clinician he gave priority to ears, eyes, and hands, to the common diseases, and to the simple fundamental essentials of treatment. In affairs the same aptitude for stripping the trimmings from a problem, for declining to be led into byways, and for simple directness in speech and thought was apparent.

But his brilliance was not attained without effort. He worked everywhere and at all times—and he expected others to work as hard as he did himself.

One by one his house-physicians were taken down to his home late on Friday night. On Saturday morning came the inevitable question : "Would you prefer to do some gardening or to sit quietly and read a book ?" One answer alone was possible. One man only in all the years said he would prefer to read a book, and made Horderian history in so doing.

With this immense capacity for work went firm self-discipline, and the gift of detachment. His ability to focus his entire mind on a given problem was one of the things that made him so great a clinician. He never wasted energy by allowing his thoughts to go idly round and round—which perhaps was partly why his mind remained razor-keen to the end of his long life. He loved an argument and played it like a game of chess.

Evangelical training in childhood had engendered a love of Biblical language which remained and helped to shape his admirable English prose style. (He enjoyed quotation and could never resist the apt remark—sometimes too apt.) But his youth had not been easy. There were no State scholarships in his young days, and his early struggles had enhanced a streak of loneliness which sometimes made personal contacts difficult. None the less, his life was never allowed to lose its savour. Every day was an adventure, every dawn a time to be up and doing, and every moment a time for wit or wisdom.

"The garden at Petersfield was very near his heart, and he had always time to instruct and convert any human being to become a lover of Nature. His knowledge was quite vast—on trees (of which he had hundreds), on rockery plants, on the character of the soil, and on the ways and means of improving the soil. His garden is a vale with a river running through. When I was last with him there, with the sun producing long shadows through the trees, and everything tranquil (a word he liked to use), I could not but remember some lines written by a Welsh poet, which translated go something as follows : 'Oh God, thou wert a little unkind to make these vales and dales so beautiful and the days of a shepherd so few.'"

With his tremendous zest for life, Horder regarded personal illness as something rather vulgar and a waste of time. Not many weeks ago, when he had a slipped disc, he said that he knew the proper treatment was to go to bed for a fortnight, but at his age he had not the time. Last Saturday morning he had a sudden and severe coronary thrombosis. The pain was soon relieved, but the shock was too great for survival. It was characteristic that during periods of consciousness he calmly reviewed his symptoms with exactly the same clear detachment he had used when teaching students at the bedside. In the evening he died at peace in his room, which overlooks his garden.

Lord Horder married in 1902 Geraldine Rose, daughter of Arthur Doggett of Newnham Manor, Herts. She died in 1954. One of their two daughters is married to Dr. E. R. Cullinan. Their only son, Mr. Mervyn Horder, the publisher, succeeds to the barony. A memorial service to Lord Horder will be held at St. Martin-in-the-Fields, on Monday, Sept. 5, at noon.

THOMAS GORDON CAMERON

M.C., F.R.C.S.

Mr. T. G. Cameron, surgeon to the South West Durham group of hospitals, died on July 19 at the age of 37.

He was born at Sunderland, co. Durham, and educated at Rossall School. He studied medicine at King's College Medical School, Newcastle upon Tyne, graduating in 1940. In the same year, after holding resident appointments at Sunderland Royal Infirmary and at an E.M.S. hospital at Ryhope, he was commissioned as a lieutenant in the R.A.M.C. He served with the 11th Light Field Ambulance until 1944, when he became regimental medical officer of the 13/18th Hussars, Queen Mary's Own. He landed with the regiment in Normandy on D-day and a few weeks later was given an immediate award of the Military Cross for "extreme devotion to duty under continuous mortar fire, showing a complete disregard for his own personal safety in order to render medical assistance to others." Later he was posted to the Army Blood Transfusion Service, and given command of a field transfusion unit, and towards the end of the European campaign he worked for two months at Belsen concentration camp. Afterwards he was promoted to the rank of major, and made senior medical officer of troopships, serving in the S.S. *Stratheden* and the S.S. *Cameronia*. A few years after demobilisation he joined the Territorial Army, and served with the first Northern General Hospital T.A., in which he held the rank of lieut.-colonel.

On his return to civilian life in 1946, he decided to specialise in surgery, and he became a demonstrator in the department of anatomy at Newcastle. In 1947 he began work with the professorial surgical clinic at the Royal Victoria Infirmary, under Prof. F. H. Bentley and Mr. Norman Hodgson, first as house-surgeon and later as registrar. He took the F.R.C.S. in 1949, and two years later was appointed senior surgical registrar at the Infirmary. While holding this last appointment he gained wide surgical experience in a very short time. At this time, with the reader in medicine at Durham University, he made a detailed assessment of 400 cases after partial gastrectomy and 300 cases after vagotomy and gastroenterostomy. In 1953 he was appointed consultant surgeon to the South-West Durham group of hospitals working mainly at Bishop Auckland General Hospital.

A colleague writes : "In 1953 Cameron came to live in Bishop Auckland, and soon endeared himself to a wide circle of friends. We realised our great fortune in having amongst us a man whose skill, experience, and wise counsel was much greater than his years. His capacity for work was limitless and he was always willing to take responsibility. A man of great personality and charm, he was respected and admired by his colleagues, his patients, and friends alike. His patients could not speak too highly about him, and the excellent work he accomplished in South West Durham in so short a time, more than justified the confidence of those who appointed him."

Two other colleagues, F. G. T. and W. W., write: "For those who knew Gordon Cameron best, his capacity for friendship was his outstanding quality, and it is not surprising that his untimely death has left a grievous gap in many diverse circles. If he didn't suffer fools gladly, at least he treated them with courtesy and his judgments were always considerate and kindly. His sense of humour never deserted him, so that under all circumstances he appeared at ease and was completely without any physical fear. An ideal companion whether doing an eightsome reel in a Cheviot barn, dinghy sailing in a gale, last in a car rally, or merely coping with an irate head waiter or gendarme in Carcassonne. Under these latter circumstances, his eloquence 'en français' was remarkable, and the resulting confusion invariably won the day. We suspect that none of his listeners understood more than the occasional phrase, but Gordon understood even less! This is not to imply that he was without his domestic virtues, for those of us privileged to enjoy the hospitality of his home knew that there he had found his greatest happiness."

Mr. Cameron married Elizabeth Jordon, and leaves a year-old son.

STANLEY BARNES

M.D., D.Sc., LL.D. Birm., M.B., D.Sc. Lond., F.R.C.P.

Stanley Barnes, who died on Aug. 11 at the age of 79, was one of the great figures of the Birmingham medical school. As physician, teacher, administrator, and donor he gave it freely of his time, energy, and wisdom, and generously of his money. In particular his name will always be associated with the building of the Queen Elizabeth Hospital and the new medical school.

He was the second son of Starkie Barnes of Birmingham, and his eldest brother was the late E. W. Barnes, F.R.S., Bishop of Birmingham. From King Edward's School, Camp Hill, in 1892 he went with an entrance scholarship to the Mason Science College in Birmingham. He took his B.SC. Lond. with first-class honours in physiology in 1895 and the M.B. Lond. in 1899. After serving as house-physician at the Queen's Hospital in Birmingham he came to London for postgraduate study in neurology. In 1900 he was appointed resident medical officer at The National Hospital, Queen Square, where he worked under Hughlings Jackson, Gowers, and Horsley. In 1903 he returned to Birmingham as pathologist to the Queen's Hospital. The reputation which he had already won as a neurologist was recognised by his appointment a few years later to the staff of the Birmingham General Hospital and the Queen Elizabeth Hospital. He quickly built up a large consulting practice which covered the whole of the Midlands. He was also physician to the Birmingham Eye Hospital, and he chose ocular paralysis as the subject of his Middlemore lecture in 1912. In 1914 he was elected F.R.C.P. He held office as president of the Association of British Neurologists.

[Elliott & Fry

In 1931 the orderly progress of his career was interrupted by his appointment as dean of the medical school. The ten years during which he held the post coincided with the development of the hospitals centre and the building of the new school. Each year he gave more and more of his time to administration and planning. In 1935 he jettisoned his private practice; but, as he later confessed, the limitations of his hospital work and research cost him some pangs, for "to me it was the first element in my life." When he retired in 1941 he was presented with his portrait by the United Hospital, and in the following year the University conferred on him the degree of LL.D.

T. L. H., who was his assistant physician for the best part of twenty years, writes: "Barnes was a delightful chief and he was among the first to break down the barriers which precluded an assistant physician from holding beds, and often from entering the wards of his chief, unless invited to do so. He made me welcome and put beds at my disposal, and from him I received much encouragement and a friendship which I have valued highly. He was then at the zenith of his powers as a physician and neurologist with a big reputation and extensive consulting practice in the Midlands. He was a brilliant teacher and an able exponent of physical signs. His teaching was based on his earlier training at Queen Square under Hughlings Jackson, Gowers, and Horsley whom he was wont to quote, and at times to imitate, for he was an excellent mimic. Indeed at his clinical demonstrations patients were hardly necessary.

"When he was appointed dean of the medical faculty, the hour met the man and Barnes found his true vocation. Abundant energy, a remarkably rapid grasp and retention of detail, a certain robustness, and a gift for leadership soon placed him in the front rank of medical administrators. His enthusiasm and energy knew no bounds, and many a Sunday morning did we follow him up ladders and along girders on the hospital centre site to see some unusual viewpoint or some new system of heating and drainage.

"He enjoyed life to the full, but it was not all work. He well knew the importance of leisure and recreation, and brought to them the same enthusiasm as he gave his official duties. He followed the advice of a physician of an older day to take a good holiday once a year, but not to be always away. During his working years he played golf regularly and competently at the weekends, and in the spring and summer in company with a few special friends he would go to the outer Hebrides or West of Ireland for his favourite hobby, fishing. For the rest he rarely took a weekend off. He was never idle and, even when physically restricted by the passing years and poor health, he made simple but valuable researches into the breaking strain of nylon fibre. Fishermen everywhere are in his debt for his small book *Anglers' Knots in Gut and Nylon*, now in its third edition. His last work was his *History of the Birmingham Medical Centre*, beautifully produced and published at his own expense in 1952.

"Barnes had a great gift for friendship and his wide interests made him a delightful companion. He was outstanding in any company for his distinguished appearance, genial manner, courtesy, and conversation. His generosity was remarkable and his gifts many and varied; donations to funds connected with the university and medical school, the furnishing of the chapel of the Queen Elizabeth Hospital, the beautiful panelling and furnishing of the faculty room in the medical school, hard tennis-courts, a cycle-shed, and other amenities for the students, and, most recently, a generous gift towards the building of a new stand at the Edgbaston ground of the Warwickshire County Cricket Club, of which he was president at the time of his death. These are well known. Not so well known is the good he did by stealth. He had a great love for the young and an understanding of their difficulties, and there are many past students who bless his name.

"A generation has grown up in Birmingham which knew not Stanley Barnes, save as a distinguished name in the annals of the medical school; but those of us who were his contemporaries or served under him recall with affection, gratitude, and pride the man and his achievements. The Queen Elizabeth Hospital and more especially the Birmingham Medical School stand as memorials to one who, greatly gifted, used those gifts in the service of his fellow men. *Si monumentum requiris circumspice. Ave atque vale.*"

Dr. E. W. AINLEY-WALKER, for many years dean of the Oxford Medical School and reader in pathology in the University, died on Aug. 15 at the age of 84.

Births, Marriages, and Deaths

DEATHS

HORDER.—Peacefully, on Aug. 13, at Ashford Chace, Petersfield, Hampshire, Thomas Jeeves, first Baron, G.C.V.O., dearly loved father and grandfather. Memorial service, St. Martin-in-the-Fields, Monday, Sept. 5, at noon.

Notes and News

STRUCTURE OF VITAMIN B_{12}

AN important advance in our knowledge of vitamin B_{12} was reported last week.[1] In the laboratory of chemical crystallography at Oxford, Mrs. Dorothy Hodgkin, F.R.S., has analysed the molecular structure of the vitamin. This is the outcome of research carried out in association with workers under Sir Alexander Todd at Cambridge, the Glaxo Laboratories at Greenford, and the University of California in Los Angeles. The whole structure of the molecule is now known, though there are one or two parts on which further work still needs to be done. As a result, chemical synthesis may be possible before long, and new light may be thrown on the way in which vitamin B_{12} acts.

COÖPERATIVE EPIDEMIOLOGY IN GENERAL PRACTICE

AN epidemiological study of epidemic winter vomiting, glandular fever, and infective hepatitis is described by the research subcommittee of the South East England Faculty of the College of General Practitioners. The authors admit that their work has produced no new knowledge, and that the number of cases of the conditions observed was small. But the report is interesting as an account of an exercise in research method, in which diseases not statutorily notifiable are reported by a group of general practitioners.

METHYLPENTYNOL ON POISONS LIST

FROM Aug. 15 methylpentynol ('Oblivon') is added to part I of the Poisons List and the first schedule to the Poisons Rules.[2]

WITH HILLARY TO EVEREST

Sir John Hunt's official record of the climbing of Everest was a remarkable effort. Written in a month in response to strong demand, it contained all the facts—and nothing else, except of course its very beautiful pictures. Unless the reader was thinking of organising the next expedition to Everest he would probably read its text rather with interest than with positive enjoyment. Sir Edmund Hillary's book [3] is different. Two years have gone by and the clamour for news has died down. In the interval Hillary has been busy lecturing, bee-keeping, getting married, nearly getting killed, and preparing for his Antarctic expedition; but he has found time to produce a book which contains the personal point of view which was necessarily lacking in the official record. In consequence his book will be enjoyed by armchair explorers as well as by experts. Hillary may lack the literary style of Shipton and the racy humour of Tilman, but he has allowed enough of himself to show through for us to understand something of the feelings of the writer and his companions on the mountain. We can go "With Hillary to Everest," as half a century or so ago some of us went "With Roberts to Kandahar" and "With Kitchener to Khartoum."

Royal College of Surgeons in Ireland

The fellowship of the college has been conferred on Dr. Philip Feanny.

Medical Research Council

Dr. H. Stanley Banks, who has lately retired from his posts as physician-superintendent of Park Hospital and consultant in infectious diseases to the South East Metropolitan Regional Hospital Board, will join the staff of the council in the autumn as medical officer (part-time) in charge of publications.

International Congress of Neuropathology

This congress is to be held at the Royal College of Surgeons of England, Lincoln's Inn Fields, London, W.C.2, from Sept. 12 to 17, under the presidency of Dr. J. G. Greenfield. Further particulars may be had from the hon. secretary, Dr. W. H. McMenemey, Maida Vale Hospital for Nervous Diseases, London, W.9.

1. *Times*, Aug. 13, 1955.
2. Poisons List Order, 1955 (S.I. 1955, no. 1134). H.M. Stationery Office. 2*d*. Poisons Rules, 1955 (S.I. 1955, no. 1135). H.M. Stationery Office. 2*d*.
3. High Adventure. By Sir EDMUND HILLARY. London: Hodder & Stoughton. 1955. Pp. 224. 16*s*.

University of London

Dr. Roger Warwick, lecturer in anatomy in the university of Manchester, has been appointed to the university chair of anatomy at Guy's Hospital Medical School.

Dr. Warwick graduated in medicine and science at the University of Manchester in 1937. Later he held resident appointments at the professorial unit at Manchester Royal Infirmary and at Cheadle Royal Mental Hospital. During the late war he served as a surgeon lieutenant in the R.N.V.R. In 1952 he was awarded the gold medal for his M.D. thesis, and the following year the Symington prize of the Anatomical Society of Great Britain. His published work includes papers on the oculomotor nucleus of the monkey and on sarcoma of bone in the ring-tailed lemur.

Dr. R. H. Gorrill, senior lecturer in bacteriology at St. Mary's Hospital Medical School, has been appointed to the university readership in bacteriology at Guy's Hospital Medical School.

Dr. Gorrill qualified from Charing Cross Hospital Medical School in 1943 and served as a surgeon lieutenant in the R.N.V.R. He took his M.B. in 1946 and his M.D. two years later. Before taking up his present appointment at St. Mary's he held the post of senior registrar in bacteriology there. He has published papers on experimental staphylococcal infection in mice, properties of complement, and bacterial localisation in the kidney.

On July 20 the degree of M.D. was awarded to Dennis Mendel.

Middlesex County Medical Society

Dr. T. Rowland Hill will give the John Tate lecture on Wednesday, Sept. 14, at 5.30 P.M. in the Middlesex Guildhall, London, S.W.1. He is to speak on the National Health Service and Its Problems—Lessons Learned Since 1948. All doctors are invited.

Health Clinic in Kent

On July 26, Mr. Iain Macleod, the Minister of Health, in opening a health clinic at St. Paul's Cray, Kent, said that "The ultimate aim of the health service is not to provide hospitals but to make sure that people do not need to go into hospital." He paid tribute to the undramatic but valuable work of the preventive services. "There is no way we can tell how many children, mothers, and families have had perhaps their sanity, and certainly their balances, restored by the services put at their disposal by the local health authorities."

CORRIGENDUM: *14th British Congress of Obstetrics and Gynæcology.*—Last week, in reporting Dr. G. F. Abercrombie's remarks to the congress, we said he had conducted personally 768 confinements. The figure should be 268.

Appointments

ANDERSON, W. D., M.B. Camb.: asst. M.O., Western region, British Railways.
BRIGGS, BARBARA, M.B. Sheff.: school M.O., Morley and Ossett.
DODDS, R. J., M.B. Durh., D.P.H.: M.O.H., Smethwick, Staffs.
JOHNSTON, R. N., M.D. Aberd., M.R.C.P.: whole-time chest physician (consultant) tuberculosis service, Dundee and Arbroath area.
LODWICK, JANE, M.B. Camb.: school M.O., Rotherham district.
RAMSAY, T. A., M.B. Glasg., F.R.F.P.S.: deputy group medical superintendent, Dundee Royal Infirmary and Maryfield Hospital.
TURNER, WILLIAM, M.B. Leeds: school M.O., Harrogate.
WESTCOMBE, K. G., B.M. Oxfd.: senior casualty officer, accident and orthopædic service, High Wycombe Hospital.

South Eastern Regional Hospital Board:

HARRIS, PHILIP, M.R.C.P.E., F.R.C.S.E., whole-time neurosurgeon, Royal Infirmary of Edinburgh and Bangour Hospital.
KERR, J. M., M.D. Edin., D.P.H.: group medical superintendent, Edinburgh southern hospitals board of management.
MARQUIS, R. M., M.B.E., M.B. Edin., M.R.C.P.E.: part-time physician, department of cardiology, Royal Infirmary, Edinburgh.
MUIR, AGNES P., M.B. Edin., D.A.: anæsthetist (S.H.M.O.), West Lothian group of hospitals, main duties at Bangour Hospital.
WALBAUM, P. R., M.B. Edin., F.R.C.S.E.: whole-time thoracic surgeon, based at the Eastern General Hospital, Edinburgh.

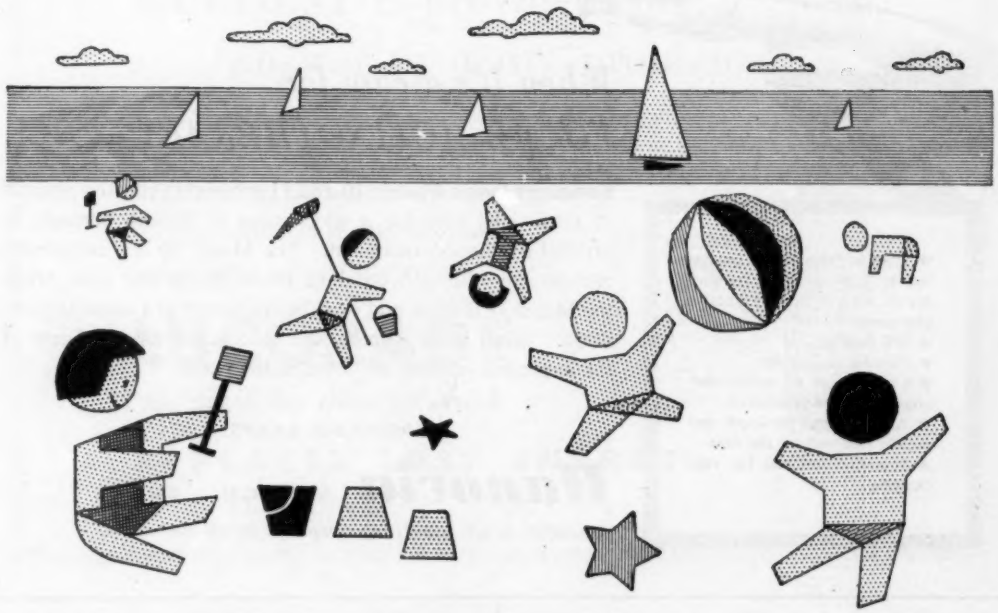
South Western Regional Hospital Board:

REID, A. A., M.B. Durh., M.R.C.P., D.P.M.: senior psychiatric registrar, Moorhaven Hospital, Ivybridge, South Devon.
ROBINS, R. H. C., M.B. Camb., F.R.C.S., senior orthopædic registrar, Exeter clinical area.
WHITE, R. H. R., M.B. Camb., M.R.C.P., D.C.H.: medical registrar St. Martin's Hospital and the Royal National Hospital for Rheumatic Diseases, Bath.

Manchester Regional Hospital Board:

CHARLTON, DOROTHY B., M.B. Manc., D.Obst., D.A.: asst. anæsthetist, main duties in Macclesfield and district hospitals.
COLE, MARY P., M.D. Belf., F.F.R.: D.M.R.T.: consultant radiotherapist, Christie Hospital and Holt Radium Institute.
TASKER, J. H., M.B. Camb., F.R.C.S.: consultant surgeon, Crumpsall and Ancoats Hospitals.

IN "SUMMER DIARRHOEA"



Precisely how warm weather influences the incidence of infective diarrhoea in children is uncertain, but the increased number of flies and amount of dust makes it more likely that milk and food will become contaminated, while the rapid multiplication in warm weather of the various organisms known to be associated with the disease may lead to increased virulence.

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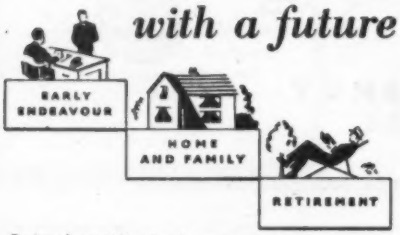

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For terms and further particulars apply to the Medical Superintendent (TELEPHONE: Northampton 4354 (3 lines)), who can be seen in London by appointment.

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Applications with the names of 2 referees and a summary of the proposed work should reach the Secretary of the Institute of Clinical Research, The Middlesex Hospital Medical School, 40, Hanson-street, London, W.1, not later than the 15th October, 1955.

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H. C. BUTTERFIELD, Registrar.

The University, Bristol, 8.

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(UNIVERSITY OF WALES)

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Grants are available from the above Fund for award to medical practitioners and to non-medical men engaged in work of medical importance who are ordinarily resident in the County of Glamorgan.

The purpose of the grant is to assist those wishing to travel abroad on short visits of medical interest.

Further particulars and form of application may be obtained from the Secretary of the School, 34, Newport-road, Cardiff, by whom applications for grants in 1956 must be received not later than 1st October, 1955.

UNIVERSITY OF ST. ANDREWS. Eastern Regional HOSPITAL BOARD. The University Court of the University of St. Andrews and the Eastern Regional Hospital Board invite applications for appointment as LECTURER IN SURGERY in Queen's College, Dundee, University of St. Andrews. The salary attached to this appointment is £1700 rising by annual increments to £2200 p.a., together with F.S.S.U. benefits, and the person appointed will receive an Honorary appointment from the Eastern Regional Hospital Board as Assistant Surgeon with the status of Consultant. The University of St. Andrews operates a scheme of family allowances and a grant towards expenses of removal may be made.

Further particulars of the appointment may be obtained from the undersigned, with whom 14 copies of the application containing the names of 3 referees should be lodged not later than 8th September, 1955.

PATRICK CUMMING, Joint Clerk to the University Court.

THE UNIVERSITY OF LEEDS. Department of Medicine. Applications are invited from qualified medical practitioners for appointment as LECTURER IN MEDICINE at a salary on a scale £1100–£100–£1700 a year, according to qualifications and experience. Duties will be primarily concerned with the day-to-day administration of a Metabolic Ward.

Applications (3 copies), stating date of birth, qualifications, and experience, together with the names of 3 referees, should reach the Registrar, The University, Leeds, 2 (from whom further particulars may be obtained), not later than 14th September, 1955.

THE UNIVERSITY OF MANCHESTER. Applications are invited from candidates with medical qualifications registrable in this country for the post of LECTURER IN ANATOMY. Good research facilities available. Salary on the scale £1000–£1800 p.a. with membership of F.S.S.U. and Children's Allowance Scheme; initial salary according to qualifications and experience. The successful candidate will be expected to take up his duties as soon as possible.

Applications should be sent, not later than 15th September, 1955, to the Registrar, The University, Manchester, 13, from whom further particulars and forms of application may be obtained. Overseas applicants should send letters of application giving details of qualifications and experience, and should submit the names of at least 2 persons to whom reference may be made.

INSTITUTE OF UROLOGY. In association with St. Peter's, St. Paul's and St. Philip's Hospitals. Applications are invited for an appointment as RADIOLOGICAL RESEARCH ASSISTANT for 3 notional half-days per week, mainly in the X-ray Departments of St. Peter's and St. Paul's Hospitals. Salary at the rate of £600 p.a. The appointment will be for 1 year in the first instance. Candidates should be prepared to undertake research in Cine-radiography with the Image Intensifier and should have experience in Radiology.

Applications, with the names of 3 referees, should be forwarded to the Secretary, Institute of Urology, 10, Henrietta-street, London, W.C.2, by 17th September, 1955. Further information may be obtained on request.

UNIVERSITY OF THE WITWATERSRAND, Johannesburg, SOUTH AFRICA. DEPARTMENT OF PHARMACOLOGY AND THERAPEUTICS. Applications are invited for appointment to the following vacant posts:—

SENIOR LECTURESHIP on the salary scale £1100–£50–£1450 p.a.* The post is one carrying senior responsibilities in the Department of Pharmacology and Therapeutics, particularly in regard to the teaching of pharmacology and the control of practical laboratories and the animal population. The incumbent of the post should have a first-class knowledge of modern pharmacological methods, including cytological, enzymological, and experimental techniques.

JUNIOR LECTURESHIP on the salary scale £550–£50–£750 p.a.* The successful applicant will be expected preferably to have had some experience of teaching either physiology or pharmacology and to have some knowledge of at least the experimental techniques used in pharmacology. A knowledge of cytological and enzymological methods will be a recommendation. The incumbent of the post will be expected to take an active part in the practical teaching in the department to M.B. students and candidates for the Diploma in Anæsthetics and the Diploma in Nursing, as well as taking a share in the lecture programme of the department. In addition, the successful candidate must be prepared to undertake research.

*In addition a married man will receive cost-of-living allowance at such rate as may be authorised from time to time, the present rate being £234 p.a.

In both cases membership of the University Institutions' Provident Fund will be compulsory. Membership of the Staff Medical Aid Fund is also compulsory in those cases where officers are found eligible for membership in terms of the rules. The successful applicants will be expected to assume duty on 1st January, 1956, or as soon as possible thereafter.

Applicants are advised to obtain the information sheet regarding the above vacancies from the Secretary, Association of Universities of the British Commonwealth, 36, Gordon-square, London, W.C.1. The closing date for the receipt of applications, in South Africa and London, is 10th October, 1955.

UNIVERSITY COLLEGE OF SOUTH WALES AND MONMOUTHSHIRE. Required, DEMONSTRATOR (Woman) for part-time teaching duties in the Department of Anatomy, University College, Newport-road, Cardiff. The appointment involves attendance on 4 afternoons per week during the College term and carries an honorarium of £300 per session. Duties to commence 1st October, 1955.

Applications should be sent to the Registrar, University College, Cathays Park, Cardiff, by Saturday, 3rd September.

Hospital Services : Senior Appointments

HOSPITALS FOR DISEASES OF THE CHEST. The Board of Governors invites applications for the appointment of ASSISTANT CARDIOLOGIST (Consultant) to the Hospitals for Diseases of the Chest. In the first instance, the appointment involves attendance, for 2 notional half-days weekly at the London Chest Hospital, and in due course, the successful candidate may be invited to undertake up to 3 additional notional half-days at Brompton Hospital. Further information may be obtained on request.

Applications (9 copies), stating date of birth, qualifications and experience, with the names of 3 referees, should reach the undersigned not later than 17th September, 1955.

KENNETH A. F. MILES, Secretary to the Board.

Brompton Hospital, S.W.3.

LONDON HOSPITAL, Whitechapel, E.1. Applications are invited for the post of Part-time CONSULTANT in General Surgery. Candidates must be Fellows of the Royal College of Surgeons. The successful candidate will be required to attend not less than 4 half-days weekly.

Applications (12 copies) giving full particulars, together with the names and addresses of 3 referees, should be sent to the undersigned (from whom further particulars may be obtained) to arrive by 30th September, 1955.

H. BRIERLEY, House Governor.

MIDDLESEX HOSPITAL, W.1. Applications invited for the post of ASSISTANT PHYSICIAN for diseases of the nervous system (Consultant) for 4 half-days weekly. Candidates must be Fellows or Members of the Royal College of Physicians of London.

Applications, naming 3 referees should be sent to the Deputy-Superintendent by 17th September.

NATIONAL HOSPITALS FOR NERVOUS DISEASES. The Board of Governors invites applications for the appointment of ANÆSTHETIST (Consultant status) at the Maida Vale Hospital for Nervous Diseases, Maida Vale, W.9. The appointment will be part-time and the successful applicant will be required to attend 2 half-days per week.

Applications (35 copies), giving the names of 3 referees, must be submitted to the undersigned not later than 10th September, 1955.

H. EWART MITCHELL,
Secretary to the Board of Governors.

The National Hospitals for Nervous Diseases,
Queen-square, W.C.1.

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD.

(1) CONSULTANT OPHTHALMOLOGIST, 6 half-days a week. Duties at Luton and Dunstable Hospital (250 Beds) and St. Mary's Hospital, Luton (164 Beds), 4 half-days a week, and St. Albans City Hospital (384 Beds), 2 half-days a week. Beds temporarily available at North Herts and South Bedfordshire Hospital, Hitchin.

Applications by 29th September, 1955.

(2) CONSULTANT PSYCHOTHERAPIST, 5 half-days a week. Napsbury Hospital, near St. Albans, Herts (2106 Beds).

Applications by 26th September, 1955.

(3) CONSULTANT PSYCHIATRIST, part-time, 2 half-days a week, Marlborough Day Hospital, 38, Marlborough-place, N.W.8, recently established in new premises for all forms of outpatient psychiatric treatment including group methods and child guidance.

Applications by 5th October, 1955.

Hospitals may be visited by direct appointment.

Application forms obtainable from and returnable to Secretary, North West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD requires Part-time ASSISTANT OPHTHALMOLOGIST (Senior Hospital Medical Officer grade), Female, 1 half-day per week, at the South London Hospital for Women, S.W.4.

Applications (5 copies), giving date of birth, qualifications, experience, names of 3 referees, to Secretary (S.1), South West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, by 10th September, 1955. Applicants may visit hospital by local arrangement.

EAST ANGLIAN REGIONAL HOSPITAL BOARD. CONSULTANT ANÆSTHETIST (8 notional half-days, Newmarket-Bury St. Edmunds Area. Main hospitals : Newmarket General Hospital (330 Beds) ; West Suffolk General Hospital (285 Beds) ; Saffron Walden General Hospital (43 Beds). Wide experience in specialty and higher qualifications essential.

CONSULTANT RADIOLOGIST (whole-time), Newmarket General Hospital (330 Beds) and Saffron Walden General Hospital (43 Beds). A new Radiological Department has just been completed at Newmarket. This is an additional appointment created to meet the increased volume of work at these 2 hospitals. Wide experience in specialty and higher qualifications essential.

Applications (8 copies), stating age, experience, and names of 3 referees, to Secretary of Board, 117, Chesterton-road, Cambridge, by 29th August, 1955. Candidates invited to visit hospitals by direct arrangement with Physician-Superintendent, Newmarket General Hospital.

EAST ANGLIAN REGIONAL HOSPITAL BOARD. ASSISTANT RADIOLOGIST (whole-time) Norfolk and Norwich Hospital (441 Beds). The department is the centre for Consultant Radiological services to hospitals in Norwich, Cromer, Gt. Yarmouth and Norfolk. Wide experience and higher qualification necessary. Salary scale £1500–£1950.

Applications (8 copies), stating age, experience and names of 3 referees, to Secretary of Board, 117, Chesterton-road, Cambridge, by 5th September, 1955. Candidates invited to visit hospitals concerned by direct arrangement with Hospital Management Committee Secretary at the Hospital.

EAST ANGLIAN REGIONAL HOSPITAL BOARD. CONSULTANT DENTAL SURGEON (whole-time), hospitals in Norfolk and Norwich Area. Duties will include work at the Plastic Surgical Unit, West Norwich Hospital. Wide experience in specialty and higher qualification essential.

Applications (8 copies), stating age, experience, and names of 3 referees, to Secretary of Board, 117, Chesterton-road, Cambridge, by 16th September, 1955. Candidates invited to visit hospitals by direct arrangement with Hospital Management Committee Secretary, Norfolk and Norwich Hospital.

BIRMINGHAM REGIONAL HOSPITAL BOARD.

North Staffs (Mental B) Group

Whole-time ASSISTANT PSYCHIATRIST (£1500–£1950 p.a.), Stallington Hall, Blythe Bridge (mental deficiency patients). No accommodation available. Experience specialty and D.P.M. required.

Lichfield, Sutton Coldfield and Tamworth Group

Part-time CONSULTANT ANÆSTHETIST (8 notional half-days weekly). Duties at Sutton Coldfield (3 notional half-days), Tamworth (3 notional half-days), Victoria (1 notional half-day), and Hammerwich (1 notional half-day) Hospitals, Lichfield. Experience specialty and D.A. (parts I and II) or F.F.A. required.

Applications (15 copies), stating name, age, nationality, qualifications and previous appointments, and details of 3 referees, to Secretary, Regional Hospital Board, 10, Augustus-road, Birmingham, 15, before 5th September, 1955.

LEEDS, 7. CHAPEL ALLERTON HOSPITAL. Applications are invited for the appointment of CONSULTANT in Medicine, which will be part-time (2 sessions per week). The appointment is subject to the terms and conditions of the National Health Service. Further information concerning this post can be had on application to the Medical Superintendent.

Applications (9 copies), stating nationality, date of birth, qualifications, experience, present appointment(s), and the names of 3 referees, should reach Ministry of Health, Hospital Management Branch, Norcross, Blackpool, Lancashire, by 10th September, 1955.

MANCHESTER REGIONAL HOSPITAL BOARD.

(*a*) Whole-time or maximum Part-time CONSULTANT RADIOLOGIST to the Macclesfield Hospital Centre (including Parkside Mental Hospital, Macclesfield) (6–7 notional half-days) with additional duties at Stockport Infirmary and Stepping Hill Hospital, Stockport (5–4 notional half-days). Wide experience and higher qualifications essential. 29th August, 1955.

(*b*) Whole-time or maximum part-time resident post of CONSULTANT PSYCHIATRIST AND MEDICAL SUPERINTENDENT to Whittingham Hospital, near Preston (about 3000 Beds). All modern forms of therapy are undertaken and, if desired, the consultant appointed could also act as psychiatrist to Blackpool and Fylde Hospitals, with consultation clinics at Victoria Hospital, Blackpool. Building has commenced on a modern house near the hospital. Applicants must be of high professional standing, with wide experience and possess higher qualifications. 30th August, 1955.

(*c*) Whole-time, NON-RESIDENT ASSISTANT PATHOLOGIST (Senior Hospital Medical Officer) to the West Manchester Hospital Centre based on the Group Laboratory at Park Hospital, Davyhulme, Manchester. Experience in all branches of hospital pathology desirable. Successful candidate will work under general guidance of a Consultant. 5th September, 1955.

Application forms from the Senior Administrative Medical Officer to the Board, Cheetwood-road, Manchester, 8, to be returned by dates stated.

PLYMOUTH CLINICAL AREA. South Western REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of a Whole-time SENIOR HOSPITAL MEDICAL OFFICER in Infectious Diseases in the Plymouth Clinical Area which comprises Plymouth, Kingsbridge, Tavistock, Launceston, Bude, and Liskeard. Applicants should possess a good knowledge of general medicine, infectious diseases, and venereology. The successful candidate will have care of patients at the Scott Isolation Hospital and at the South Devon and East Cornwall Hospital, Plymouth. He will be deputy to, and work under the general direction of, the Consultant Physician in these subjects.

Applications (12 copies), stating date of birth, qualifications, and experience, together with the names and addresses of 2 referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol, 8, not later than 3rd September, 1955.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the following appointments :—

Whole-time ASSISTANT ANÆSTHETIST based at Stobhill Hospital, Glasgow. Salary (at age 32 and over) on the scale £1500–£50–£1950.

Whole-time ASSISTANT PSYCHIATRIST at Hartwood Mental Hospital, Shotts, Lanarkshire. Salary (at age 32 and over) on the scale £1500–£50–£1950.

These appointments are subject to the National Health Service (Scotland) superannuation regulations.

Applications (16 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, not later than 30 days after the publication of this advertisement.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. WEST LOTHIAN (BANGOUR) HOSPITALS BOARD OF MANAGEMENT. Applications are invited from registered medical practitioners with administrative experience for the post of MEDICAL SUPERINTENDENT on the salary scale of £1675–£75(1)–£100(2)–£1950. The duties attaching to the post include responsibility to the Board of Management for the medical administration of the following hospitals in the Group: Bangour General (772 Beds); Drumshoreland (35 Beds); Tippethill (53 Beds); Bo'ness (37 Beds); St. Michael's (114 Beds).

Applications, giving particulars of age, qualifications, and experience, together with the names and addresses of 3 referees, should be sent to the Secretary, South-Eastern Regional Hospital Board, Scotland, 11, Drumsheugh-gardens, Edinburgh, 3 (from whom a note giving further information regarding the appointment is available on demand), to reach there not later than 1st October, 1955.

SHEFFIELD REGIONAL HOSPITAL BOARD. Maximum Part-time CONSULTANT PÆDIATRICIAN for North Lincolnshire. Duties at Grimsby, Louth and Scunthorpe.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 17th September, 1955.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time CONSULTANT PATHOLOGIST for Barnsley and Rotherham areas.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 17th September, 1955.

SHEFFIELD REGIONAL HOSPITAL BOARD. Part-time CONSULTANT OPHTHALMOLOGIST for 7 notional half-days per week for the Scunthorpe, Gainsborough and Brigg areas for both hospital and school clinic duties.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 17th September.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD requires Whole-time ASSISTANT PSYCHIATRIST (Senior Hospital Medical Officer grade) at St. Lawrence's Hospital, Caterham, Surrey (2250 Beds), a hospital for treatment and training of mental defectives of both sexes, of varying grades and types and of all ages. Candidates should possess D.P.M.

Applications (5 copies), giving date of birth, qualifications, experience, names of 3 referees, to Secretary (S.1), South West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, by 10th September, 1955. Applicants may visit hospital by local arrangement.

NORTHERN IRELAND HOSPITALS AUTHORITY. Applications are invited for a post as CONSULTANT RADIOLOGIST at Mid-Ulster Hospital and hospitals managed by the Mid-Antrim Hospital Management Committee (excluding Massereene Hospital, Antrim). The terms and conditions will be in accordance with the Authority's application of the Spens Report to Northern Ireland.

Applications to be made on a form obtainable (with further particulars) from the Secretary, Northern Ireland Hospitals Authority, 44–46, Queen-street, Belfast, and to be returned not later than 10th September, 1955.

AUSTRALIA. ROCKHAMPTON HOSPITALS BOARD. MEDICAL SUPERINTENDENT, Rockhampton Base Hospital. Applications in writing are invited for appointment to the above position. Salary classification £2078 10s.–£2328 10s. p.a., subject to cost-of-living adjustment. Residence, lighting and power supplied without charge. The appointment is full-time without right of private practice. Full particulars of the appointment will be forwarded upon request. The appointee is required to take up duty not later than 1st February, 1956.

Applications close 26th September, 1955, and should be addressed to the Secretary, Rockhampton Hospitals Board, Rockhampton, Queensland, Australia.

NEW ZEALAND. PALMERSTON NORTH HOSPITAL. Applications are invited for the position of VISITING ASSISTANT E.N.T. SURGEON, which is a part-time visiting appointment with full rights of private practice. Salary for 10 hours per week is at the rate of £410 or £500, according to qualifications and experience. Palmerston North Hospital has some 400 general beds. Full details of appointment and conditions may be obtained from the High Commissioner for New Zealand, 415, Strand, London, W.C.2, or direct by air mail.

Applications, with copies of testimonials, close on 19th September, 1955, and should be addressed to the Medical Superintendent.

NEW ZEALAND. THE OTAGO HOSPITAL BOARD. DUNEDIN HOSPITAL, DUNEDIN. Applications are invited from suitably qualified medical practitioners who hold a degree in medicine of an approved University, for the position of ASSISTANT MEDICAL SUPERINTENDENT, Dunedin Hospital. The position is a full-time one, and private practice is not permitted. Salary scale: £1490–£1640, plus general wage increase of £81 7s. p.a., commencing rate to be determined by the Medical Officer's Salaries Grading Committee in accordance with qualifications and experience. Full information relating to this appointment may be obtained from THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2, or from the Office of the High Commissioner for New Zealand, 415, Strand, London.

Applications, stating age, qualifications and experience, accompanied by copies of testimonials and references, health and radiological certificates, will be received by the undersigned until 10 A.M. on Tuesday, 1st November, 1955.

W. A. WILLIAMSON, Secretary.

Otago Hospital Board, P.O. Box 946, Dunedin, New Zealand.

CANADA. REGINA GENERAL HOSPITAL, Regina, SASKATCHEWAN. Applications invited from qualified Radiologists for post of DIRECTOR, Radiology Department, in 800-Bed active general hospital. Minimum starting salary $13,000.

For information apply Superintendent, Regina General Hospital, Regina, Saskatchewan.

Hospital Services : Junior Appointments

ANNIE McCALL MATERNITY HOSPITAL, Jeffreys-road, S.W.4. Applications are invited from registered Women medical practitioners for the post of RESIDENT OBSTETRIC HOUSE SURGEON (post recognised for the D.Obst.R.C.O.G.). Appointment is for a period of 6 months, vacant now.

Applications, stating age, qualifications with dates, and nationality, accompanied by copies of 3 recent testimonials, should be sent to the Secretary, Lambeth Group Hospital Management Committee, Renfrew-road, S.E.11, not later than 3rd September, 1955.

BATTERSEA GENERAL HOSPITAL, Battersea Park, S.W.11. CASUALTY OFFICER, residence optional. House Officer or Senior House Officer grade according to experience. Vacant 21st September, not pre-registration.

Apply Hospital Secretary, enclosing 2 copies of recent testimonials, by 1st September, 1955.

BEARSTED MEMORIAL HOSPITAL (Jewish Maternity Hospital), Lordship-road, N.16. Locum Tenens RESIDENT OBSTETRIC HOUSE OFFICER required for period approximately 18th September—2nd October, 1955.

Apply Hospital Secretary (Tel.: STAmford Hill 8282).

BETHNAL GREEN HOSPITAL, Cambridge Heath-road, London, E.2. (Acute—309 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (casualty).

Applications, with copies of 2 testimonials immediately to the Hospital Secretary.

BROMPTON HOSPITAL, S.W.3. Applications invited for post of RESIDENT MEDICAL OFFICER (Registrar grade). Candidates must have held a resident hospital appointment and not be under 25 years of age. Appointment is for 1 year in the first instance, commencing 1st October, 1955.

Applications, stating age, qualifications with dates, nationality and appointments held, together with copies of testimonials, by 10th September to KENNETH A. F. MILES, House Governor.

CENTRAL MIDDLESEX HOSPITAL, Park Royal, N.W.10. 2 RESIDENT SENIOR HOUSE OFFICERS required in Pathology Department. Good experience in all branches of pathology. Posts vacant 2nd October, 1955, and 28th October, 1955.

Applications, with names of 2 referees, to Medical Director by 27th August, 1955.

CONNAUGHT HOSPITAL, Walthamstow, E.17. (118 Beds.) Applications are invited for the post of CASUALTY OFFICER AND DEPUTY RESIDENT SURGICAL OFFICER, graded as Senior House Officer, vacant 25th August, 1955. Recognised for F.R.C.S. Salary £745 p.a., less £150 p.a. for board, lodging, &c.

Applications, with full details and copies of 2 recent testimonials, should be sent immediately to Secretary, Hospital Management Committee, Forest Group, Langthorne-road, E.11.

ELIZABETH GARRETT ANDERSON HOSPITAL, Euston-road, N.W.1. (ROYAL FREE HOSPITAL GROUP.) Applications are invited from pre-registration and registered women medical practitioners for the post of HOUSE SURGEON to Gynæcological Department (recognised for the M.R.C.O.G.). Duties to commence 1st October, 1955. Appointment for 6 months. Salary in accordance with Ministry of Health scale for House Officers.

Applications, with copies of 3 recent testimonials, should be sent to the Secretary, Elizabeth Garrett Anderson Hospital, by 31st August, 1955.

GROUP LABORATORY, Mile End Hospital, Bancroft-road, E.1. RESIDENT ASSISTANT PATHOLOGISTS (2) required, Senior House Officer grade. Previous experience an advantage but not essential. Laboratory recognised for Diploma of Pathology and is well equipped with excellent training facilities. Posts tenable for 1 year in first instance.

Applications, stating age, nationality, qualifications and experience, with copies of not more than 3 testimonials, to be sent to the Area Pathologist.

HACKNEY HOSPITAL, London, E.9. (General—341 Beds.) Applications are invited for 12 months appointment commencing 1st October, as SENIOR HOUSE OFFICER (obstetrics and gynæcology). Post recognised for M.R.C.O.G.

Apply, with copy testimonials, to Group Secretary, above address, by 31st August, quoting HH/SHO.

HAMPSTEAD GENERAL HOSPITAL, The Green, Haverstock-hill, N.W.3. (ROYAL FREE HOSPITAL GROUP.) Applications are invited from registered medical practitioners for the post of RESIDENT CASUALTY OFFICER (Senior House Officer grade) for the main Outpatients Department, Bayham-street, N.W.1. Vacant 1st October, 1955, tenable for a period of 6 months. Salary £745 p.a.

Application forms may be obtained from the Secretary, to whom they should be returned, together with copies of 3 recent testimonials, by 31st August, 1955.

HOSPITALS FOR DISEASES OF THE CHEST. Applications invited for post of SENIOR SURGICAL REGISTRAR (whole-time). The appointment is for 1 year with eligibility for reappointment and will involve duties within the Group. Candidates must hold the Diploma of F.R.C.S.

Applications stating age, qualifications (with dates), nationality and appointments held, together with copies of testimonials by 10th September, 1955, to—

KENNETH A. F. MILES, Secretary to the Board.

Brompton Hospital, London, S.W.3.

HENDON ISOLATION HOSPITAL, Goldsmith-avenue, London, N.W.9. (92 infectious diseases beds and 20 gynæcological.) Locum RESIDENT JUNIOR HOSPITAL MEDICAL OFFICER required for 3 weeks commencing 5th September, 1955, at above Hospital. Previous similar experience desirable.

Apply immediately to Physician-in-charge.

HAMMERSMITH HOSPITAL AND INSTITUTE OF OBSTETRICS AND GYNÆCOLOGY, London, W.12. SENIOR HOUSE OFFICER (obstetrics and gynæcology) required 1st September. Post recognised for M.R.C.O.G.

Applications, stating age, qualifications, experience, names of 2 referees to Secretary, Board of Governors, by 27th August.

KING EDWARD MEMORIAL HOSPITAL, Ealing. SENIOR HOUSE OFFICER required 18th October, 1955, at above Hospital, for duty in Casualty Orthopædic and Fracture Departments. Resident at Clayponds Hospital, South Ealing, and in charge of beds there.

Applications, stating age, nationality, qualifications with dates, and details of experience, together with copies of 2 recent testimonials to Group Secretary, South West Middlesex Hospital Management Committee, West Middlesex Hospital, Isleworth, Middlesex, by 29th August, 1955.

LEWISHAM HOSPITAL, London, S.E.13. Applications are invited for the post of SENIOR HOUSE OFFICER (casualty) at the above Hospital. Vacant on 1st September and recognised for 6 months training for F.R.C.S. Salary £745 p.a., less £150 for emoluments if resident.

Applications, stating age, qualifications and experience, with copy testimonials or names of referees, to Secretary, Group Offices, Lewisham Hospital, S.E.13.

LONDON CHEST HOSPITAL. Hospitals for Diseases of THE CHEST. 2 Vacancies occur 1st October, 1955, for RESIDENT HOUSE PHYSICIAN. Appointments for 6 months, 4 in London, 2 at the Country Branch, near Letchworth, and posts graded as House Officer. Duties include work in the Outpatient Department and Refill Clinic as well as in wards.

Applications, stating age, qualifications with dates, and previous appointments held, with copies of 3 testimonials, should reach the undersigned not later than 26th August.

THOMAS BROWN, House Governor.

London Chest Hospital, E.2.

LONDON CHEST HOSPITAL. Hospitals for Diseases of THE CHEST. A vacancy occurs 1st November, 1955, for RESIDENT SURGICAL OFFICER. Appointment for 6 months, with prospect of renewal. Post graded as Senior House Officer or Registrar, according to qualifications and experience. Previous surgical experience necessary.

Applications, stating age, qualifications with dates and previous appointments held, with copies of 3 testimonials, should reach the undersigned not later than 20th September.

THOMAS BROWN, House Governor.

London Chest Hospital, E.2.

LONDON HOSPITAL, Whitechapel, E.1. Applications are invited for the post of SENIOR HOUSE OFFICER to the Department of Physical Medicine. The post becomes vacant on 1st November, 1955.

Applications (6 copies) giving full particulars, together with 6 copies of 3 recent testimonials should be sent to the undersigned by 31st August, 1955.

H. BRIERLEY, House Governor.

MEMORIAL HOSPITAL, Shooters Hill, Woolwich, S.E.18. SENIOR HOUSE OFFICER (Casualty Department), vacant 1st October. Recognised for F.R.C.S. 6-month resident appointment and may be renewed. Salary £745 p.a., less £150 p.a. for residence.

Apply to Secretary.

METROPOLITAN HOSPITAL, Kingsland-road, E.8. (Acute General—147 Beds.) CENTRAL GROUP (NO. 5) HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the appointment of NON-RESIDENT OUTPATIENT MEDICAL OFFICER (Senior House Officer grading). Salary £745 p.a., vacant in October, 1955.

Applications, stating age, nationality, qualifications and experience, together with 3 recent testimonials, to be addressed to the Hospital Secretary by 31st August, 1955.

MOORFIELDS WESTMINSTER AND CENTRAL EYE HOSPITAL, (MOORFIELDS BRANCH), City-road, London, E.C.1. Applications are invited for the post of SIXTH HOUSE SURGEON (Registrar), non-resident. The appointment is for a period of 4 months from 1st November, 1955, and the holder of the post at the completion of that time will be eligible for appointment as fifth, fourth, third, second House Surgeon and subsequently as Senior Resident Officer, for similar periods.

Applications should be submitted on the official form obtainable from the undersigned, stating age and qualifications, together with testimonials and photograph, and be received not later than 3rd September, 1955.

A. J. M. TARRANT, House Governor.

NEASDEN HOSPITAL, Brentfield-road, N.W.10. (Infectious diseases.) Locum Tenens REGISTRAR required from 5th to 25th September, 1955, inclusive. The post is resident and gives facilities for postgraduate studies. The Hospital is a regional centre for poliomyelitis.

Applications to Physician-Superintendent.

NELSON HOSPITAL, Kingston-road, Merton, S.W.20. HOUSE SURGEON (resident). Approved pre-registration post vacant now.

Applications, stating age, qualifications, &c., with the names and addresses of 2 referees, should be sent to the Secretary at the above address.

NORTH MIDDLESEX HOSPITAL, Edmonton, N.18. HOUSE PHYSICIAN, post-registration, resident, required for 1st October for 6 months. General medicine.

Applications, stating age, nationality, qualifications, experience, with copies of recent testimonials, to Secretary of Hospital, by 30th August.

NORTH MIDDLESEX HOSPITAL, Edmonton, N.18. HOUSE SURGEON, pre-registration (first or second post), resident, required for 1st October for 6 months. General (including genito-urinary) surgery. Post recognised for F.R.C.S.

Applications, stating age, nationality, qualifications, experience, with copies of recent testimonials, to Secretary of Hospital, by 30th August.

NATIONAL HOSPITALS FOR NERVOUS DISEASES. MEDICAL REGISTRAR (non-resident) at Maida Vale Hospital for Nervous Diseases, London, W.9. Applications are invited for the above full-time appointment, grading as Senior Registrar. Appointment to commence 1st November, 1955. Preference will be given to a candidate holding a higher degree who intends to specialise in neurology.

Applications, with copies of 3 recent testimonials, to be sent to the Secretary at Maida Vale Hospital not later than 3rd September, 1955.

NORTH EAST METROPOLITAN REGIONAL HOS-PITAL BOARD.

REGISTRAR in Pathology (non-resident), Southend General Hospital, Southend-on-Sea, Essex. Recognised for D.Path. Excellent facilities for training in all branches of pathology.

REGISTRAR in Tuberculosis (resident), Harts Hospital, Woodford Green, Essex.

2 ANÆSTHETIC REGISTRARS (non-resident; sleeping in on duty nights), Chase Farm Hospital, Enfield, Middlesex. Recognised for D.A. and F.F.A.

ANÆSTHETIC REGISTRAR (resident), Bethnal Green Hospital, E.2. Recognised for F.F.A.

MEDICAL REGISTRAR (non-resident), St. Mary's Hospital, Plaistow, E.13.

MEDICAL REGISTRAR (resident), St. Margaret's Hospital, Epping, Essex.

MEDICAL REGISTRAR (resident or non-resident), German Hospital, Dalston, E.8.

SURGICAL REGISTRAR (non-resident; sleeping in on duty nights), North Middlesex Hospital and Annexes, Silver-street, N.18. Recognised for F.R.C.S.

Appointments subject to review after 1 year.

Separate applications in duplicate with 2 copies of 2 recent testimonials, to Secretary, 11A, Portland-place, W.1, by 3rd September, 1955.

POPLAR HOSPITAL, East India Dock-road, E.14. (120 Beds.) Required, HOUSE SURGEON (pre-registration post). Duties include inpatient, outpatient and casualty work. Recognised for F.R.C.S. Vacant 7th September.

Applications, stating age, nationality and qualifications, to the Hospital Secretary.

PUTNEY HOSPITAL, Lower Common, London, S.W.15. HOUSE SURGEON (resident). Vacant 5th September. Open to registered practitioners and pre-registration candidates.

Apply Hospital Secretary, enclosing copies of 3 recent testimonials, by 24th August.

QUEEN ELIZABETH HOSPITAL FOR CHILDREN MANAGEMENT COMMITTEE. Hackney-road, E.2, Shadwell, E.1, and BANSTEAD WOOD, SURREY. HOUSE OFFICER. Appointment will be made for 2 consecutive periods of 6 months commencing at Hackney-road 1st October, 1955. First period as House Physician and second as House Surgeon and Casualty Officer.

Application forms may be obtained from the Secretary at Hackney-road and should be returned, with copies of not more than 3 testimonials, on or before the 25th August, 1955.

QUEEN MARY'S HOSPITAL FOR THE EAST END. Stratford, E.15. PÆDIATRIC HOUSE PHYSICIAN (House Officer, third post). Duties will include some work in related departments (e.g., Diabetic Clinic, &c.). 6-month appointment commencing 17th September, 1955. Post recognised for D.C.H.

Applications, with copies of recent testimonials, to Group Secretary, West Ham Group Hospital Management Committee, Stratford, E.15, by 25th August, 1955.

QUEEN MARY'S HOSPITAL FOR THE EAST END. Stratford, E.15. HOUSE SURGEON (Male or Female, third post) for 6 months commencing 16th September, 1955. Post recognised for F.R.C.S.

Applications, with copies of recent testimonials, to Group Secretary, West Ham Group Hospital Management Committee, Stratford, E.15, by 25th August, 1955.

ROYAL EYE HOSPITAL. King's College Hospital GROUP. Applications are invited for the post of SENIOR HOUSE OFFICER from 1st October, 1955.

Applications, with copies of recent testimonials, should be made to the Secretary, The Royal Eye Hospital, St. George's-circus, S.E.1.

ROYAL NORTHERN HOSPITAL, Holloway, London, N.7. (279 Beds.) NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR required in the Orthopædic and Fracture Department of the above Hospital. Candidates may visit the Hospital by direct appointment.

Application forms obtainable from, and returnable to, the Secretary, Royal Northern Hospital, N.7, by 30th August, 1955.

ST. ANDREW'S HOSPITAL, Bow, E.3. Applications are invited for the post of HOUSE SURGEON (recognised pre-registration post) vacant on 25th August. Post is tenable for 6 months.

Applications, stating age and qualifications, with copies of at least 1 testimonial should be sent immediately to the Medical Superintendent, St. Andrew's Hospital, Bow, E.3.

ST. LEONARD'S HOSPITAL, Nuttall-street, London, N.1. (Acute general—192 Beds.) Applications are invited for the post of RESIDENT ANÆSTHETIST (Senior House Officer) with additional duties in the Group. The post is recognised for the D.A. Good opportunities will be given to study for higher qualifications.

Applications, with 2 recent testimonials, to the Hospital Secretary within 7 days.

ST. CLEMENT'S HOSPITAL, London, E.3. Bow Group HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER required for Psychiatric Unit consisting of 24 observation beds and 36 Beds for treatment of neuroses and early psychoses. Unit run in conjunction with the London and Claybury Hospitals. Post recognised for D.P.M. Vacant early September.

► Apply to Group Secretary, Committee Offices, 2A, Bow-road, E.3, with names of 3 referees.

ST. MARY'S HOSPITAL AND NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. PADDINGTON GENERAL HOSPITAL. Applications are invited for the post of Part-time REGISTRAR to the E.N.T. Departments. The successful candidate will be required to undertake, from a date to be arranged :—

2 notional half-days per week (Monday and Thursday mornings) at St. Mary's, and

3 notional half-days per week (Tuesday and Friday mornings and Friday afternoons) at Paddington General Hospital.

Applications, stating nationality, date of birth, permanent address, qualifications with dates, details and National Health Service gradings of previous and present appointments, together with the names and addresses of 3 referees, should reach ALAN POWDITCH, House Governor, St. Mary's Hospital, W.2, not later than 7th September, 1955.

ST. MARYLEBONE HOSPITAL FOR PSYCHIATRY AND CHILD GUIDANCE, 48, Cosway-street, N.W.1. Applications are invited for the post of REGISTRAR in the Child Guidance Department for 1 session per week. Applicants should have had previous experience in child guidance.

Application forms obtainable from, and returnable to, Secretary, Paddington Group Hospital Management Committee, Harrow-road, W.9, by 5th September, 1955.

ST. STEPHEN'S HOSPITAL, Fulham-road, Chelsea, S.W.10. HOUSE PHYSICIAN (resident). General medicine with some tuberculosis. Post-registration.

Applications, naming 2 referees, to Medical Superintendent.

ST. THOMAS'S HOSPITAL, London, S.E.1. Research REGISTRAR to the Department of Psychological Medicine. 1 year in the first instance. Successful candidate to devote whole-time to clinical research in psychiatric treatment.

Applications, including names and addresses of 2 referees, to the Clerk of the Governors by 31st August, 1955.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. LAMBETH HOSPITAL, Brook-drive, S.E.11. Applications are invited for the post of MEDICAL REGISTRAR vacant in November, 1955. The appointment will be for 1 year in the first instance. Preference will be given to applicants having a higher qualification in medicine.

Forms of application (enclosing a stamped addressed envelope) from the Secretary to whom completed forms should be returned not later than 3rd September, 1955. Canvassing will disqualify, but candidates are not precluded from visiting the Hospital.

SOUTH WESTERN HOSPITAL, Landor-road, S.W.9. RESIDENT HOUSE OFFICER (Senior House Officer grade) required to take charge of 32 surgical beds under the direction of the Surgical Consultant of Lambeth Hospital, Kennington ; and also to work under the E.N.T. Surgeon at the South Western Hospital.

Form of application from the Group Secretary, Lambeth Group Hospital Management Committee, Renfrew-road, S.E.11.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. There will be a vacancy for a Whole-time ASSISTANT MEDICAL REGISTRAR (Registrar grade), falling vacant in October.

Further particulars and form of application, which must be returned not later than 7th September, 1955, may be obtained from the undersigned.

H. F. RUTHERFORD, House Governor and Secretary.

WEST END HOSPITAL FOR NEUROLOGY AND NEUROSURGERY, 91, Dean-street, W.1. Applications are invited for the resident post of SENIOR HOUSE SURGEON. Candidates should have had surgical experience and previous neurological and neurosurgical experience would be an advantage.

Applications, stating age, qualifications, experience, together with the names and addresses of 2 referees, to reach the Hospital Secretary, by 5th September, 1955.

WESTMINSTER CHILDREN'S HOSPITAL. (Westminster Hospital Teaching Group.) Applications are invited for the post of MEDICAL REGISTRAR for duty starting October, 1955. The appointment is for 1 year in the first instance.

Applications, with names of 3 referees, should reach the Secretary, Westminster Children's Hospital, Vincent-square, S.W.1, by 31st August, 1955.

WHITTINGTON HOSPITAL, London, N.19. Applications are invited for the following appointments.

SENIOR HOUSE OFFICER, resident (E.N.T.). Recognised for D.L.O.

*HOUSE PHYSICIANS (general medicine). 5 posts. Recognised for M.D. (Lond.).

HOUSE PHYSICIAN (geriatrics).

*HOUSE PHYSICIAN (paediatrics). Recognised for M.D. (Lond.) and D.C.H.

†HOUSE SURGEON (general surgery). Recognised for F.R.C.S. (Eng.).

*HOUSE SURGEON (obstetrics). 2 posts. Posts recognised for M.R.C.O.G. in obstetrics.

All posts vacant 1st October, 1955.

*Pre-registration candidates who have already held a first appointment are invited to apply.

†Pre-registration candidates are invited to apply.

Applications, giving age, qualifications, &c., together with copies of 2 recent testimonials and the name of 1 referee, to the Medical Superintendent, Whittington Hospital, London, N.19, by 29th August, 1955.

WANSTEAD HOSPITAL, Hermon Hill, E.11. (191 Beds.) Applications are invited for the post of CASUALTY OFFICER, recognised for F.R.C.S. Graded Senior House Officer. Salary £745 p.a., less £150 p.a. for board, lodging, &c.

Applications, with full details and copies of 2 recent testimonials, should be sent immediately to the Secretary, Forest Group Hospital Management Committee, Langthorne-road, E.11.

WANSTEAD HOSPITAL, Hermon Hill, London, E.11. (191 Beds.) HOUSE SURGEON required. Post vacant now. Recognised for F.R.C.S.

Applications, with full details and copies of 2 recent testimonials, should be sent immediately to Secretary, Forest Group Hospital Management Committee, Langthorne-road, E.11.

ABERYSTWYTH GENERAL HOSPITAL. Mid Wales HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER at the above Hospital. Post recognised for F.R.C.S. Vacant now. The post is resident.

Applications, stating age, nationality, qualifications, and experience, accompanied by copies of 2 recent testimonials, should be sent to the Group Secretary, "Orlandon," North-parade, Aberystwyth, within 14 days from the publication of this advertisement.

ASHFORD HOSPITAL, Ashford, Middlesex. Staines GROUP HOSPITAL MANAGEMENT COMMITTEE. Required, RESIDENT HOUSE OFFICER (Male) for special departments (E.N.T., paediatrics, ophthalmology, dermatology, &c.). 6-month appointment, vacant after 17th August, 1955. Not suitable for pre-registration candidates.

Applications, stating age, qualifications and experience, with copies of up to 3 recent testimonials, to Medical Director of Hospital.

ASHFORD HOSPITAL, Ashford, Middlesex. Staines GROUP HOSPITAL MANAGEMENT COMMITTEE, RESIDENT HOUSE SURGEON (Male) required at above Hospital for Traumatic and Orthopaedic Unit. 6-month appointment, vacant on 1st October. Preference given to pre-registration candidates.

Applications stating age, qualifications and experience, with copies of up to 3 recent testimonials to Medical Director of Hospital immediately.

ASHTON, HYDE AND GLOSSOP HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON required at Ashton-under-Lyne General Hospital. Preference will be given to pre-registration applicants. Recognised for F.R.C.S. (Eng.).

Applications, stating age, nationality, qualifications and experience, together with copies of 3 testimonials, should be forwarded to the Group Secretary, Ashton-under-Lyne General Hospital, Ashton-under-Lyne, Lancs, as soon as possible.

AYLESBURY, BUCKINGHAMSHIRE. STOKE MANDEVILLE HOSPITAL. (609 Beds.) HOUSE PHYSICIAN for Paediatric Department. The post qualifies for D.C.H. Duties will include care of children in Infectious Diseases Unit, Plastic Unit, and Outpatient Department at the Royal Buckinghamshire Hospital. Recognised pre-registration post. Applications from registered practitioners will be considered. Post vacant early September.

Apply with copies of 2 testimonials to Administrative Officer.

BARNSLEY. ST. HELEN HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER (obstetrics and gynaecology), vacant 1st October. The Hospital is recognised in obstetrics and gynaecology for M.R.C.O.G.

Applications, with copies of 2 testimonials, to Group Secretary, Barnsley Hospital Management Committee, 33, Gawber-road, Barnsley.

BARROW-IN-FURNESS. NORTH LONSDALE HOSPITAL. BARROW AND FURNESS HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for posts of SENIOR HOUSE SURGEON and of HOUSE SURGEON (pre-registration) at the North Lonsdale Hospital, Barrow-in-Furness. Posts recognised for F.R.C.S.

Applications to Group Secretary, 52, Paradise-street, Barrow-in-Furness.

BARROW-IN-FURNESS. RISEDALE MATERNITY HOSPITAL. BARROW AND FURNESS HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for a resident post of SENIOR HOUSE OFFICER in the Obstetric and Gynaecology Department based at the above Hospital. Approved for D.Obst.R.C.O.G. Post available approximately 1st November.

Applications to the Group Secretary, 52, Paradise-street, Barrow-in-Furness.

BEBINGTON, CHESHIRE. CLATTERBRIDGE HOSPITAL. (730 Beds.) HOUSE OFFICER (general surgery) required in this modern and expanding Hospital for the 6 months commencing 1st September, 1955. Recognised pre-registration post. Salary according to previous posts held.

Application forms from the Hospital Secretary, to be returned as soon as possible.

BEDFORD GENERAL HOSPITAL. (437 Beds.) Locum CASUALTY OFFICER (Registrar grade) required end August, pending permanent appointment. Salary £17 10s. per week.

Applications, stating age, nationality, qualifications, and previous appointments, together with copies of 2 recent testimonials, should be forwarded to Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. GENERAL HOSPITAL. Applications are invited for the post of MEDICAL REGISTRAR (Registrar grade) for duty as Resident Medical Officer. The post is now vacant and is tenable for 1 year in the first instance. Candidates must have held a resident appointment and should have the M.R.C.P. (London).

Forms of application may be obtained from, and should be returned as soon as possible to, the Secretary, United Birmingham Hospitals, Queen Elizabeth Hospital, Birmingham, 15.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. Applications are invited for the post of REGISTRAR in Radiodiagnosis (non-resident), Registrar grade for duties in the United Hospitals.

Application forms may be obtained from the Secretary, United Birmingham Hospitals, Queen Elizabeth Hospital, Birmingham, 15, and should be returned to him as soon as possible.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS AND THE BIRMINGHAM REGIONAL HOSPITAL BOARD. Applications are invited for the joint whole-time appointment of NON-RESIDENT REGISTRAR in Diagnostic Radiology (Senior Registrar grade). The duties will be apportioned at 5 sessions in the Teaching Hospital and 6 sessions in the Dudley Road Hospital Group, mainly at Dudley Road Hospital. Candidates must be registered medical practitioners, have had previous experience in the specialty and possess a diploma in radiology.

Forms of application may be obtained from the Secretary, United Birmingham Hospitals, Queen Elizabeth Hospital, Birmingham, 15, and should be returned by 27th August, 1955.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. Applications are invited for the post of RESIDENT CLINICAL PATHOLOGIST (Senior House Officer grade) in the Department of Bacteriology and Clinical Pathology at the General Hospital. The appointment is tenable for 1 year.

Application forms may be obtained from the Secretary, United Birmingham Hospitals, Queen Elizabeth Hospital, Birmingham, 15, and should be returned to him as soon as possible.

BIRMINGHAM AND MIDLAND EAR AND THROAT HOSPITAL, Edmund-street, BIRMINGHAM, 3. HOUSE OFFICER required. Pre-registration considered.

Detailed applications, with copies of 2 recent testimonials, to Secretary, Dudley Road Hospital, Birmingham, 18.

BIRMINGHAM, 18. DUDLEY ROAD HOSPITAL. Whole-time RESEARCH ASSISTANT (£850–£965 p.a.) for 1 year; principally to assist in development of clinical research into ætiology of chronic bronchitis. Experience general medicine required but research experience not essential.

Application forms from Secretary, Regional Hospital Board, 10, Augustus-road, Birmingham, 15, to be returned before 5th September, 1955.

BIRMINGHAM, 9. LITTLE BROMWICH HOSPITAL. RESIDENT MEDICAL OFFICER in Infectious Diseases (Junior Hospital Medical Officer or Senior House Officer) grade according to experience. Hospital serves a wide area and gives opportunities for study of infectious diseases. Part of Hospital is being developed as General Hospital, where further experience can be gained.

Apply Physician-Superintendent.

BIRMINGHAM, 9. LITTLE BROMWICH HOSPITAL. PÆDIATRIC HOUSE PHYSICIAN (Male or Female), vacant 23rd September, 1955. Recognised for D.C.H., includes duties in Infectious Diseases Wards and Neonatal Department and Clinics.

Apply Physician-Superintendent.

BIRMINGHAM REGIONAL HOSPITAL BOARD.

(1) **Birmingham (Dudley Road) Group, Birmingham, 18**

REGISTRAR in E.N.T. Surgery (resident) for Birmingham and Midland Ear and Throat Hospital. Recognised D.L.O. and F.R.C.S.

(2) **No. 20 Group, Coventry and Warwickshire Hospital, Coventry**

(*a*) REGISTRAR in Infectious Diseases (resident) for Whitley Hospital (143 Beds). Duties mainly with 90 infectious diseases beds; other units concerned with skin diseases and pulmonary tuberculosis. Liaison with Pædiatric Department. Self-contained flat available. Vacant 24th September, 1955.

(*b*) REGISTRAR in Orthopædic Surgery for Hospital of St. Cross, Rugby (156 Beds). Vacant 31st August. Experience specialty essential. Higher qualification desirable. Recognised F.R.C.S. Resident.

(3) **Shrewsbury Group, Royal Salop Infirmary, Shrewsbury**

REGISTRAR in E.N.T. Surgery. Eye, Ear and Throat Hospital (68 Beds) and Copthorne Hospital (168 Beds). Resident/non-resident. Considerable experience specialty desirable.

(4) **Stoke-on-Trent Group, Princes-road, Hartshill, Stoke-on-Trent**

REGISTRAR in Obstetrics and Gynæcology. Duties mainly at City General Hospital (845 Beds). Experience specialty essential. Resident/non-resident. Recognised M.R.C.O.G./D.Obst. R.C.O.G.

(5) **Walsall Group, Wednesbury-road, Walsall**

REGISTRAR in General Medicine (resident) for Manor Hospital (333 Beds). Experience specialty essential.

(6) **South Warwickshire Group, 50, Holly-walk, Leamington Spa**

REGISTRAR in General Surgery (resident). Experience specialty desirable. Recognised F.R.C.S.

Application forms from Group Secretaries, to be returned before 5th September, 1955. Candidates may visit hospitals.

BIRMINGHAM. SOLIHULL HOSPITAL, Lode-lane, SOLIHULL. OBSTETRIC AND GYNÆCOLOGICAL HOUSE SURGEON (Senior House Officer grade). Vacant beginning of September.

Applications stating age, qualifications, nationality and copies of testimonials to Medical Superintendent.

BIRMINGHAM. ST. CHAD'S HOSPITAL, Hagley-road, BIRMINGHAM, 16. SENIOR HOUSE OFFICER in Obstetric and Gynæcological Unit. Vacant 1st September, 1955. Post recognised for M.R.C.O.G. Unit affiliated with University of Birmingham for undergraduate clinical tuition.

Detailed applications with copies of 2 recent testimonials to the Group Secretary, Dudley Road Hospital, Birmingham, 18.

BIRMINGHAM, 29. SELLY OAK HOSPITAL. (1040 equipped beds.) SENIOR HOUSE OFFICER (anæsthetics), resident/non-resident.

Apply Medical Superintendent with details of qualifications, experience, age, and copies of 3 recent testimonials.

BIRMINGHAM, 15. THE SKIN HOSPITAL, IN-PATIENTS' DEPARTMENT, George-road. SENIOR HOUSE OFFICER or HOUSE OFFICER according to experience. Modern well-equipped Inpatients' Department, providing facilities for study of skin diseases. Required to assist Consultant at outpatient clinics.

Applications, with copies of 2 recent testimonials, to Secretary, Dudley Road Hospital, Birmingham, 18.

BEVERLEY, YORKSHIRE. WESTWOOD HOSPITAL. (229 Beds.) Pre-registration HOUSE OFFICER in Obstetrics and Gynæcology. Vacant early September. Hospital has Maternity Unit of 22 Beds and Gynæcological Annexe of 18 Beds. Fully qualified practitioners may apply.

Detailed applications to Group Secretary.

BEVERLEY, YORKSHIRE. WESTWOOD HOSPITAL. (220 Beds.) ORTHOPÆDIC HOUSE SURGEON (first, second, or third post). Offers good opportunity for general experience in busy acute general hospital. Approved pre-registration post. Fully qualified practitioners may apply. Recognised for F.R.C.S.

Apply to Group Secretary.

BIRKENHEAD. SAINT CATHERINE'S HOSPITAL. DIABETIC CENTRE. Applications are invited for the post of CLINICAL ASSISTANT in the above Centre, for 4 notional sessions per week. Higher qualifications and great experience in the management of diabetes are essential. Salary £175 p.a. per session. Terms and conditions in accordance with those of the Medical Whitley Council for the Health Services.

Apply by 31st August to the Group Secretary, Birkenhead Hospital Management Committee, St. James' Hospital, Birkenhead, giving age, details of qualifications and experience, with the names of 2 referees.

BOLTON. THE ROYAL INFIRMARY. (237 Beds.) BOLTON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. RESIDENT SENIOR HOUSE OFFICER in Orthopædic Surgery. Vacant August, tenable for 12 months and recognised for F.R.C.S.

Applications, with the names of 2 referees, to Group Secretary, The Royal Infirmary, Bolton.

BOLTON DISTRICT GENERAL HOSPITAL. (604 Beds.) RESIDENT SENIOR HOUSE OFFICER in Medicine. Tenable for 12 months.

Applications, stating age, nationality, qualifications, experience, and the names of 2 referees should be sent to Group Secretary, Bolton and District Hospital Management Committee, The Royal Infirmary, Bolton.

BRACKNELL, BERKSHIRE. CHURCH HILL HOUSE MENTAL DEFICIENCY INSTITUTION. Applications invited from General Practitioners for post involving part-time general medical duties at above Institution. Appointment calls for average attendance of 1 notional half-day a week and carries a salary of £175 p.a. Institution may be visited by direct appointment.

Application forms obtainable from and returnable to Secretary, Windsor Group Hospital Management Committee, Almaroad, Windsor, by 1st September.

BRISTOL-COSSHAM FRENCHAY HOSPITAL MANAGEMENT COMMITTEE. FRENCHAY HOSPITAL. (513 staffed beds, expanding.) Applications are invited for the post of SENIOR HOUSE OFFICER in the regional Neurosurgery Department. This post offers useful surgical experience and the opportunity of gaining a working knowledge of neurological diagnosis. Recognised for F.R.C.S.

Applications to the Secretary, Frenchay Hospital, quoting "N.S.F." Names of 2 referees required.

BRISTOL. HAM GREEN HOSPITAL, Pill, near Bristol. Applications are invited for the post of RESIDENT ASSISTANT PHYSICIAN in the Infectious Diseases Department (350 Beds) of this Hospital. The Hospital contains a major poliomyelitis unit, a tuberculous meningitis treatment centre, and offers wide experience in acute medicine. Salary and conditions on Junior Hospital Medical Officer scale. Previous experience essential.

Applications, stating age, qualifications, &c., to the Resident Physician.

BRAINTREE, ESSEX. BLACK NOTLEY HOSPITAL. (544 Beds.) Applications invited for post of HOUSE OFFICER (orthopædic surgery). First, second, third or pre-registration post; tenable for 6 months. Recognised for F.R.C.S.

Applications, with copies of 3 testimonials, to the Group Secretary, Colchester Hospital Management Committee, 14, Pope's-lane, Colchester.

BISHOP'S STORTFORD, HERTFORDSHIRE. HAYMEADS HOSPITAL. (400 Beds. Midway between London and Cambridge. Main Line Railway from Liverpool Street.) Locum Tenens HOUSE OFFICER required for period from this date until 9th September, 1955, to cover holiday periods of House Surgeon, House Officer, Pædiatrics, Obstetrics, &c.

Applications, stating age, nationality, qualifications and experience, with copies of recent testimonials or the names of referees to the Hospital Secretary.

BISHOP'S STORTFORD AND DISTRICT HOSPITAL, Rye-street, BISHOP'S STORTFORD, HERTS. (67 Beds—medical, surgical and maternity. Midway between London and Cambridge. Main Line Railway from Liverpool Street.) Applications are invited from registered medical practitioners for the appointment of RESIDENT SENIOR HOUSE OFFICER. Appointment to commence as soon as possible. Salary £745 p.a.

Applications, stating age, nationality, qualifications and experience, with copies of recent testimonials or names of referees, should be sent to the Hospital Secretary, Haymeads Hospital, Bishop's Stortford, Herts.

BISHOP'S STORTFORD, HERTFORDSHIRE. HAYMEADS HOSPITAL. (400 Beds. Midway between London and Cambridge. Main Line Railway from Liverpool Street.) Applications are invited for the post of SENIOR HOUSE OFFICER (medical) for duties mainly in the Tuberculosis Unit of 43 Male and 23 Female beds. Salary £745 p.a., less £130 p.a. in respect of residential emoluments provided. Appointment to commence on or as soon as possible after 11th August, 1955.

Applications, stating age, nationality, qualifications and experience, with copies of recent testimonials or the names of referees to the Hospital Secretary.

CAMBRIDGE. ADDENBROOKE'S HOSPITAL. House SURGEON for 6 months from 17th October. Recognised Pre-registration Service.

Apply stating age, nationality, qualifications and experience with dates, and copies of 3 testimonials, to the Secretary by 3rd September. Interviews 19th September.

CARSHALTON, SURREY. ST. HELIER HOSPITAL. CASUALTY OFFICER (Senior House Officer), vacant 26th August. Post recognised for F.R.C.S.

Applications, stating age, experience and qualifications, with copies of recent testimonials and the names of 2 referees, to the Group Secretary at above address.

CHEPSTOW, MONMOUTHSHIRE. PLASTIC SURGERY JAW INJURIES AND BURNS CENTRE, ST. LAWRENCE HOSPITAL. (100 plastic surgery, 50 orthopædic beds.) 2 SENIOR HOUSE OFFICERS in Plastic Surgery required, 1 about 21st August, and the other about 15th September. Previous experience in specialty not essential. The successful candidates will receive a thorough training in plastic surgery and burns. Hospital intakes from most of Wales and provides extensive experience. There is also a Senior House Officer in orthopædics. Salary £745, less £150 board-residence.

Write, quoting 2 referees, to T. A. JONES, Group Secretary. 64, Cardiff-road, Newport, Mon.

CHERTSEY, SURREY. ST. PETER'S HOSPITAL (late Botley's Park War Hospital). (430 Beds.) RESIDENT HOUSE SURGEON (Senior House Officer or Intern) required for the Gynæcological (30 Beds) and E.N.T. (16 Beds) Departments. Duties to commence 17th September, 1955. Salary in accordance with terms and conditions of National Health Service.

Applications, together with names and addresses of referees, to be sent to the Physician-Superintendent, St. Peter's Hospital, as soon as possible.

CHESTERFIELD. SCARSDALE HOSPITAL. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER for Geriatric Unit and to assist in the supervision of nurses health. Full consultant services. Excellent scope for persons interested in this specialty. Good resident accommodation available for single man or married couple without children.

For further information apply M. H. BOONE, Secretary, Chesterfield Hospital Management Committee, at Chesterfield Royal Hospital.

CHESTERFIELD ROYAL HOSPITAL. Senior House OFFICER required at above Hospital for Accident and Orthopædic and Casualty Departments. Post recognised for F.R.C.S. training and offers valuable experience. National salary and conditions.

Apply M. H. BOONE, Secretary, Chesterfield Hospital Management Committee.

COVENTRY AND WARWICKSHIRE HOSPITAL. (354 Beds.) SENIOR HOUSE OFFICER in Ophthalmology. Resident. Recognised D.O. Provides good experience in both inpatient and outpatient work.

Apply Secretary, Group 20 Hospital Management Committee, Stoney Stanton-road, Coventry.

COVENTRY AND WARWICKSHIRE HOSPITAL. (354 Beds.) SENIOR HOUSE OFFICER (Casualty Department). Recognised F.R.C.S., vacant now. Resident.

Apply Secretary, Group 20 Hospital Management Committee, Stoney Stanton-road, Coventry.

COVENTRY AND WARWICKSHIRE HOSPITAL. (354 Beds.) SENIOR HOUSE OFFICER in Orthopædics (60 Beds). Vacant now. Resident.

Apply Secretary, Group 20 Hospital Management Committee, Stoney Stanton-road, Coventry.

CROYDON GENERAL HOSPITAL. (200 Beds.) South WEST METROPOLITAN REGIONAL HOSPITAL BOARD. CROYDON GROUP HOSPITAL MANAGEMENT COMMITTEE. SENIOR CASUALTY OFFICER (Registrar status). Post vacant. Busy department. Post recognised for final F.R.C.S. examination.

Application forms obtainable from GEORGE A. PAINES, Group Secretary, Hospital Management Committee, General Hospital, Croydon, to be returned within 14 days.

DONCASTER ROYAL INFIRMARY. Doncaster HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of ORTHOPÆDIC HOUSE SURGEON in the grade of Senior House Officer. £145 p.a. deducted for residential emoluments.

Applications should be forwarded to the Secretary to the Committee, Doncaster Royal Infirmary.

DONCASTER ROYAL INFIRMARY. (330 Beds.) DONCASTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE SURGEON. Approved as pre-registration post and recognised for F.R.C.S.

Applications to the Secretary to the Committee at the Doncaster Royal Infirmary.

DONCASTER ROYAL INFIRMARY. (Recognised under the regulations for the Fellowship and D.L.O.) DONCASTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER in the E.N.T Department. Post vacant now.

Applications to the Secretary to the Committee at the Doncaster Royal Infirmary.

DARLINGTON (near). AYCLIFFE HOSPITAL, Heighington, near DARLINGTON. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER at the above Hospital for mental defectives. A suitable house is available for a married man at a reasonable charge and resident accommodation can also be provided for an unmarried medical officer. The Hospital is a modern one and approved for the D.P.M. examinations of the Durham University and Conjoint Examining Board. At present there are 564 Beds to be increased shortly by the addition of new villas to 664. Salary will be in accordance with the terms and conditions of hospital medical and dental staffs, i.e., £775–£50–£1075 p.a.

Candidates are invited to visit the Hospital by arrangement with the Medical Superintendent, to whom applications should be addressed, together with the names and addresses of 2 referees, not later than 1st September, 1955.

DRIFFIELD, YORKSHIRE. NORTHFIELD SANATORIUM. (78 Beds.) SENIOR HOUSE PHYSICIAN. Vacant early October. Offers experience all branches of tuberculosis within Group, including surgery, mass miniature radiography, and clinics. Time for study. Ex-patients welcome. £165 for full residence.

Applications to Group Secretary, Westwood Hospital, Beverley, Yorkshire.

EBBW VALE GENERAL HOSPITAL. (General beds 71, maternity 15.) Applications are invited for the following appointments :—

(*a*) JUNIOR HOSPITAL MEDICAL OFFICER.
(*b*) SENIOR HOUSE OFFICER.

The Hospital is an active Surgical Unit and the medical staff consists of a resident Surgeon and visiting orthopædic, gynæcological, and ophthalmic Surgeons.

The tenure of appointment shall be for:—
(*a*) a period not exceeding 4 years ; and
(*b*) a period of 12 months.

Apply giving full details and references to Group Secretary, North Monmouthshire Hospital Management Committee, Nevill Hall Hospital, Abergavenny, Mon.

EDGWARE GENERAL HOSPITAL, Edgware, Middlesex. (715 Beds.) RESIDENT HOUSE PHYSICIAN for Thoracic and Dermatological Department. Duties to include taking of acute general medical cases. 6-month appointment.

Applications, stating age, qualifications, experience, and enclosing copies of up to 3 recent testimonials, to Medical Director of Hospital by 3rd September, 1955.

EDINBURGH (near). ROSSLYNLEE HOSPITAL, ROSSLYN CASTLE, MIDLOTHIAN. HOUSE OFFICER, SENIOR HOUSE OFFICER, or JUNIOR HOSPITAL MEDICAL OFFICER. Applications are invited for the above psychiatric posts. This hospital of 400 Beds is 10 miles from Edinburgh and offers good training and experience in all modern methods of psychiatric treatment. Accommodation available for single officer, Male or Female.

Applications, with the names of 2 referees, to the Physician-Superintendent.

ENFIELD GROUP HOSPITAL MANAGEMENT COMMITTEE. Appointment of RESIDENT HOUSE SURGEON (first post—approved pre-registration). Vacant 25th October, 1955. General surgical duties. Registered practitioners within 3 months of qualification eligible. 6-month appointment.

Applications, with names of 2 referees, to the Secretary of the Management Committee.

ENFIELD, MIDDLESEX. CHASE FARM HOSPITAL. ENFIELD GROUP HOSPITAL MANAGEMENT COMMITTEE. RESIDENT HOUSE PHYSICIAN (Senior House Officer grade) required, commencing 17th October, 1955, for general medical and pædiatric duties. 12-month appointment.

Applications, with names of 2 referees to the Secretary of the Management Committee.

EPPING. ST. MARGARET'S HOSPITAL. (480 Beds.) HOUSE PHYSICIANS. 2 fully registered practitioners required from 20th September for medical division at St. Margaret's Hospital and medical ward at Honey Lane Hospital. Progressive Hospital with fully staffed department.

Applications, with 2 recent testimonials, to reach Group Secretary, St. Margaret's Hospital, Epping, Essex, by 27th August.

GLASGOW. HAWKHEAD (MENTAL) HOSPITAL, 510, Crookston-road, GLASGOW, S.W.3. Applications are invited for the post of SENIOR HOUSE OFFICER in Psychiatry (Male or Female), resident or non-resident. The post offers wide experience and training in all aspects of psychiatry (inpatient and outpatient), and all modern methods of treatment are carried out. Recognised for D.P.M.

Applications, together with the names of 2 referees, should be forwarded as soon as possible to Physician-Superintendent at above address.

GLASGOW, S.W.1. SOUTHERN GENERAL HOSPITAL. JUNIOR HOSPITAL MEDICAL OFFICER required in Department of Anæsthesia. Salary scale £775–£50–£1075 p.a.

Applications, in writing, to the Group Medical Superintendent within 14 days of the appearance of this advertisement.

GRIMSBY GENERAL HOSPITAL. Grimsby Hospital MANAGEMENT COMMITTEE. Applications are invited for the post, now vacant, of SENIOR HOUSE OFFICER (orthopædic). Up-to-date medical library and reading facilities available.

Applications, with names and addresses of 2 referees, to Hospital Secretary, Grimsby General Hospital.

GRIMSBY GENERAL HOSPITAL, Grimsby, Lincolnshire. (238 Beds.) GRIMSBY HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (general medicine) required. Medical Unit of 49 Beds. Up-to-date medical library and reading facilities available.

Applications, with names of 2 referees, to Hospital Secretary.

GRIMSBY GENERAL HOSPITAL. (238 Beds. Recognised for training for F.R.C.S.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT SURGICAL REGISTRAR required. Married accommodation may be available. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 29th August, 1955, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

GRIMSBY GENERAL HOSPITAL, Grimsby, Lincolnshire. (238 Beds.) GRIMSBY HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of JUNIOR HOSPITAL MEDICAL OFFICER (orthopædic). Unit of 47 Beds. The position may be resident or non-resident by arrangement. Up-to-date medical library and reading facilities available. Salary £775–£50–£1075 p.a., with appropriate deduction if resident.

Applications, stating age, qualifications, experience, &c., with names of 3 referees, to be forwarded to the Hospital Secretary as soon as possible.

GRANTHAM AND KESTEVEN GENERAL HOSPITAL. (115 Beds.) SHEFFIELD REGIONAL HOSPITAL BOARD. SECOND RESIDENT SURGICAL OFFICER with duties in orthopædics, gynæcology, E.N.T., and relief duties for Resident Surgical Officer, required at Registrar rate of pay from 7th September. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 29th August, 1955, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

GUILDFORD. ROYAL SURREY COUNTY HOSPITAL. (232 Beds.) RESIDENT HOUSE SURGEON required for general surgery. Post is vacant on 22nd August and tenable for 6 months. It is approved for pre-registration practitioners and recognised for the F.R.C.S. examination.

Applications, with copies of 3 testimonials, should be sent to the Hospital Secretary as soon as possible.

GUILDFORD. ROYAL SURREY COUNTY HOSPITAL. (232 Beds.) CASUALTY OFFICER required. The post is recognised for the F.R.C.S. and the grading that of Senior House Officer. 2 Casualty Officers are employed who share the work of the department which is part of the Orthopædic and Traumatic Unit. Regular instruction is given in traumatic surgery and Casualty Officers take part in the work of fracture clinics. Post is vacant on 19th September.

Applications with copies of testimonials to the Hospital Secretary.

HAROLD WOOD HOSPITAL, Harold Wood, Essex. (415 Beds.) SENIOR HOUSE OFFICER (Casualty Department), required immediately. Recognised for F.R.C.S. examination. Near London with good travelling to all parts. Salary £745 p.a., less £130 p.a. for board-residence.

Apply to Hospital Secretary (Tel. Ingrebourne 2881).

HEREFORD. COUNTY HOSPITAL. (335 Beds.) HOUSE OFFICER (pædiatrics) required.

Applications, with copies of 2 recent testimonials, to Medical Superintendent, County Hospital, Hereford.

HULL A GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER in the E.N.T. Departments of the Victoria Hospital for Sick Children and the Hull Royal Infirmary. The post which will become vacant on 1st September, 1955, counts towards the F.R.C.S. and D.L.O.

Applications, with testimonials, should be sent to the Secretary, Victoria Hospital for Sick Children, Park-street, Hull.

HAVERFORDWEST. PEMBROKE COUNTY WAR MEMORIAL HOSPITAL. (163 Beds. Recognised by the Royal College of Surgeons, and for Pre-registration Service.) WEST WALES HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT SENIOR HOUSE OFFICER (surgical), which is now vacant. Salary and conditions of service as laid down by the Ministry of Health.

Applications, stating age, qualifications, experience, nationality with names and addresses of 3 referees, to the Group Secretary, West Wales Hospital Management Committee, Glangwili, Carmarthen.

HAVERFORDWEST. PEMBROKE COUNTY WAR MEMORIAL HOSPITAL. (163 Beds. Recognised by the Royal College of Surgeons, and for Pre-registration Service.) WEST WALES HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT HOUSE OFFICER (surgical), vacant now. Salary and conditions of service as laid down by the Ministry of Health.

Applications, stating age, qualifications, experience, nationality with names and addresses of 3 referees, to the Group Secretary, West Wales Hospital Management Committee, Glangwili, Carmarthen.

HITCHIN, HERTFORDSHIRE. LISTER HOSPITAL. Applications are invited for the post of RESIDENT HOUSE SURGEON, vacant 19th September, 1955. Recognised as pre-registration post.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 recent testimonials, to be sent to the Medical Administrator as soon as possible.

HASTINGS GROUP HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (anæsthetics) required for duties within the Group. Post, recognised for Diploma in Anæsthetics, will be vacant in September. National scale of salary £745 p.a.

Apply to Group Secretary, 11, Holmesdale-gardens, Hastings.

HASTINGS. ST. HELEN'S HOSPITAL. (489 Beds.) SENIOR HOUSE OFFICER (obstetrics) required. Resident, Male or Female. 40-Bedded unit. Post recognised for D.Obst.R.C.O.G. Vacant mid-September. National scale of salary.

Apply to Hospital Administrator.

HASTINGS. ROYAL EAST SUSSEX HOSPITAL. (150 Beds.) SENIOR HOUSE OFFICER (casualty and orthopædic) required. Post vacant 1st September, 1955. National scale of salary.

Apply to Hospital Administrator.

ISLEWORTH. WEST MIDDLESEX HOSPITAL. House OFFICER for Geriatric Unit (resident), full-time.

Applications, stating age, nationality, qualifications and experience, with copies of up to 3 recent testimonials to Group Secretary, South West Middlesex Hospital Management Committee, West Middlesex Hospital, Isleworth, Middlesex, by 24th August, 1955.

ILFORD AND BARKING GROUP HOSPITAL MANAGEMENT COMMITTEE. There is a vacancy for a SENIOR HOUSE OFFICER at the Ilford Isolation Hospital, Grove-road, Chadwell Heath (near London). Salary will be at the rate of £745 p.a. less emoluments. Small furnished bungalow available. This post is suitable for persons studying for the M.R.C.P. and D.C.H.

Applications, giving particulars of experience and qualifications, and accompanied by copies of testimonials, should be sent to the undersigned within 7 days of the appearance of this advertisement.

King George Hospital, Ilford. H. F. HARRIS, Secretary.

ILKLEY. MIDDLETON HOSPITAL. (430 Beds.) RESIDENT SENIOR HOUSE OFFICER (surgical) required for Major Thoracic Surgical Unit at the above Hospital, tenable from 16th October, 1955.

Applications, stating age, nationality, qualifications and experience, to Hospital Secretary.

LEEDS, 2. PUBLIC DISPENSARY AND HOSPITAL. LEEDS A GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the appointment of CASUALTY OFFICER (Senior House Officer) at the above Hospital. The appointment, which is recognised by the Royal College of Surgeons for Fellowship, will be for a period of 1 year. Salary in accordance with the agreed terms and conditions of service of hospital medical and dental staffs, with an appropriate deduction in respect of board, lodging, &c.

Applications, stating age, qualifications, experience, &c., together with the names of 2 referees, to be forwarded to the undersigned as soon as possible.

J. FOLKARD, Secretary to the Committee.

Administrative Offices, St. James's Hospital, Leeds, 9.

LEEDS REGIONAL HOSPITAL BOARD. Registrar vacancies.

Anæsthetics

(*a*) Duties mainly at Harrogate General Hospital (resident/non-resident). Recognised for F.F.A.R.C.S.

(*b*) Duties in the Hull A, Hull B and East Riding Groups. Recognised for the F.F.A.R.C.S. Duties may include thoracic anæsthesia (non-resident).

General Medicine

(*a*) Duties at St. James's Hospital, Leeds (to be associated with 50 Beds under the clinical care of Physicians from the Teaching Hospital) (resident/non-resident).

(*b*) Duties mainly at St. Luke's Hospital, Bradford (170 general medical beds) (non-resident).

(*c*) Scarborough, Bridlington, Malton and Whitby Group (67 Beds) (non-resident).

General Surgery

Halifax Group. Duties mainly at the Royal Halifax Infirmary (110 general surgical beds) (non-resident). Includes some duties in the Casualty Department.

General and Plastic Surgery

Duties at St. Luke's Hospital, Bradford (150 general surgical beds). Half the duties will be in the Plastic Unit (20 Beds) (preferably resident).

Applications, stating age, qualifications, and details of present and previous appointments with dates, together with the names and addresses of 3 referees, to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, by 25th August, 1955.

LEEDS. THE UNITED LEEDS HOSPITALS. Senior HOUSE OFFICER in General Medicine required for duties as Resident Medical Officer at the pre-convalescent annexe (117 Beds) of the General Infirmary at Leeds. The post may entail some duties at the Infirmary. Terms and conditions of service for hospital medical and dental staffs apply.

Applications, giving age, qualifications, previous posts with dates, and 3 names for reference, should be sent to the Secretary to the Board.

LEEDS. THE UNITED LEEDS HOSPITALS. The GENERAL INFIRMARY AT LEEDS. REGISTRAR in Dermatology required for 1 year in the first instance from 1st October. Terms and conditions of service for hospital medical staff apply.

Applications, stating age, qualifications, previous posts with dates, and 3 names for reference, should be sent to the Sub-Dean, School of Medicine, Leeds, 2, by 31st August, 1955.

LEICESTER (near) MARKFIELD SANATORIUM. (163 Beds.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT REGISTRAR (chest diseases) required. Duties will include attendance at Chest Clinics associated with Sanatorium under supervision of the Consultant. Minor thoracic procedures are carried out and the staff closely associated with the neighbouring major Thoracic Surgical Unit. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 29th August, 1955, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

LIVERPOOL, 18. MOSSLEY HILL HOSPITAL. (148 Beds.) SENIOR HOUSE OFFICER (medical) required for work in general medical and tropical diseases wards. National Health Service terms and conditions.

Forms of application may be obtained from the Medical Superintendent at the above address.

LIVERPOOL, 22. WATERLOO HOSPITAL. Applications are invited for a post as RESIDENT MEDICAL OFFICER (Junior Hospital Medical Officer grade), vacant from 1st September, 1955, at this General Hospital of 50 Beds. Full-time medical establishment consists of 2 such posts.

Applications to Secretary, Walton Hospital, Liverpool, 9, giving age, experience and names of 2 referees.

LIVERPOOL, 9. WALTON HOSPITAL. (1321 Beds.) Applications are invited for the resident post of SENIOR HOUSE OFFICER in Pathology, which will be vacant from 1st October, 1955. The successful candidate will work successively in the sections of haematology, bacteriology, biochemistry, histology, and in the post-mortem room under the supervision of the Consultant Pathologist.

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, to the Physician-Superintendent, Walton Hospital, Liverpool, 9, within 10 days of appearance of this advertisement.

LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS. Applications are invited for a post of Locum REGISTRAR in Surgery with duties at the Royal Southern Hospital for the period 1st October–31st December, 1955.

Apply by 31st August on form obtainable from the Secretary, 80, Rodney-street, Liverpool, 1.

LOUTH, LINCOLNSHIRE. COUNTY INFIRMARY. (215 Beds.) GRIMSBY HOSPITAL MANAGEMENT COMMITTEE.

(*a*) SENIOR HOUSE OFFICER (obstetrics, gynæcology and some other duties).

(*b*) SENIOR HOUSE OFFICER (orthopædic and casualty).

Applications are invited for the above posts, (*a*) vacant 1st October, (*b*) now vacant, at this General Hospital.

Applications, giving full details, together with the names of 2 referees, should be addressed to the Hospital Secretary.

LOUTH, LINCOLNSHIRE. COUNTY INFIRMARY. (215 Beds.) GRIMSBY HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (surgical) at this General Hospital.

Applications, giving full details, together with the names of 2 referees, should be addressed to the Hospital Secretary.

MAIDSTONE. KENT COUNTY OPHTHALMIC AND AURAL HOSPITAL. (113 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE SURGEON in the E.N.T. Department of the above Hospital. There are 55 E.N.T. beds and 6 specialist operating sessions each week. Valuable experience is available, and the post is recognised for the purpose of the F.R.C.S. and the D.L.O. Salary will be £745 a year, less £150 a year for residential emoluments.

Applications immediately to the Administrative Officer, Kent County Ophthalmic and Aural Hospital, Maidstone, Kent.

MAIDSTONE. KENT COUNTY OPHTHALMIC AND AURAL HOSPITAL. (113 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE SURGEON in the Ophthalmic Department of the above Hospital. The Hospital is recognised by the Examining Board for the F.R.C.S. and the D.L.O. Appointment will be for 12 months. Salary £745 a year, less £150 a year for residential emoluments. Post vacant mid-October, 1955.

Applications should be forwarded as soon as possible to the Administrative Officer, Kent County Ophthalmic and Aural Hospital, Church-street, Maidstone.

MAIDSTONE. WEST KENT GENERAL HOSPITAL. (141 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of RECEIVING ROOM OFFICER. Salary £745 a year, with a deduction of £150 a year for residential emoluments.

Applications to the Administrative Officer at the Hospital as soon as possible.

MALVERN. ST. WULSTAN'S HOSPITAL. (260 Beds.) RESIDENT MEDICAL OFFICER (Junior Hospital Medical Officer) required mid-September. Good experience in modern treatment of pulmonary tuberculosis. Work mainly medical but Hospital has own Thoracic Surgical Unit.

Applications to the Physician-Superintendent.

MANCHESTER, 20. WITHINGTON HOSPITAL. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (E.N.T.), resident or non-resident, with the group with principal duties at Wythenshawe Hospital. The post is recognised for the D.L.O. qualifications.

Applications, stating age, qualifications, previous post, experience and the names of 2 referees, to be forwarded to the Group Secretary as soon as possible.

MANCHESTER, 20. WITHINGTON HOSPITAL. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER to the Geriatric Department which will become vacant in August (resident or non-resident). Duties are primarily in the active medical wards. Excellent experience is available in the Unit which has been developed on modern lines and has available full general hospital facilities.

Applications, stating age, qualifications, present post, experience and the names of 2 referees, to be forwarded to the Group Secretary at the Hospital immediately.

MANCHESTER. UNITED MANCHESTER HOSPITALS. MANCHESTER ROYAL INFIRMARY, MANCHESTER, 13. 3 SENIOR HOUSE OFFICERS (surgical) to commence on 2nd and 8th November and 18th December, 1955. Whole-time non-resident training post, tenable for 6 months, renewable for a second 6 months. Duties allotted in orthopædic, surgical outpatients and general surgical units in rotation.

Application form obtainable from the undersigned, to be returned by 3rd September, 1955.

G. H. TAYLOR, Secretary.

MANCHESTER. UNITED MANCHESTER HOSPITALS. MANCHESTER ROYAL EYE HOSPITAL. Applications are invited for post of SENIOR REGISTRAR. Whole-time post (non-resident). Tenable for 12 months, subject to renewal. Previous experience in ophthalmology essential. The terms and conditions of service for hospital medical and dental staffs will apply.

Applications to be made on forms obtainable from the undersigned. Closing date 31st August, 1955.

F. J. CABLE, Secretary to the Board of Governors.

MANCHESTER. UNITED MANCHESTER HOSPITALS. SAINT MARY'S HOSPITALS, MANCHESTER. Applications are invited for the post of OBSTETRICAL HOUSE SURGEON to a Maternity Unit operating temporarily in the Whitworth Park Branch of the above-named hospital, vacant 1st November, 1955. The post is supernumerary to the establishment recognised for training purposes by the Royal College of Obstetricians and Gynæcologists. Previous obstetrical experience is desirable. An opportunity exists for a limited amount of gynæcological training during tenure of the post. National scale.

Application forms, which may be obtained from the undersigned, to be returned not later than 5th September, 1955.

A. R. WISE, General Superintendent.

Saint Mary's Hospitals, Whitworth Park, Manchester, 13.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the post of REGISTRAR in Orthopædic Surgery, to the Blackpool and Fylde Group of hospitals, with main duties at Victoria Hospital, Blackpool.

Applications, together with names and addresses of 2 referees, should be sent to the Group Secretary, Blackpool and Fylde Hospital Management Committee, Victoria Hospital, Blackpool.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the post of RESIDENT REGISTRAR in Obstetrics and Gynæcology, 1 of 2, in the West Manchester Group of hospitals with main duties at Park Hospital, Davyhulme. There are 73 obstetric beds, 31 gynæcology beds, and a special care baby unit of 7 beds at Park Hospital. Vacant 31st October, 1955. Appointment for 1 year, renewable.

Application forms from Secretary, Park Hospital, Davyhulme.

MANCHESTER REGIONAL HOSPITAL BOARD invites applications for post of RESIDENT SURGICAL REGISTRAR to Macclesfield District Group Hospitals, main duties Infirmary Branch Macclesfield Hospital. Hospital recognised for F.R.C.S. regulations

Apply immediately to Group Secretary, "Willerby House," Cumberland-street, Macclesfield, enclosing copies of 2 recent testimonials.

MANCHESTER REGIONAL HOSPITAL BOARD. Blackburn AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. RESIDENT REGISTRAR (obstetrics/gynæcology) required. Post recognised for M.R.C.O.G. Based on Queen's Park Hospital, Blackburn (a general hospital with 58 obstetric beds, mostly abnormal, and 29 gynæcological beds), with duties at Blackburn Royal Infirmary and Accrington Victoria Hospital.

Application forms available from, and returnable to, the Secretary, Hospital Management Committee Office, Royal Infirmary, Blackburn.

MANCHESTER REGIONAL HOSPITAL BOARD. Regis-TRAR in General Medicine to the Bolton and District Group of hospitals, with main duties at Bolton District General Hospital and Bolton Royal Infirmary. Vacant 1st September.

Applications, stating age, nationality, qualifications, experience, and the names of 2 referees, should be sent immediately to Group Secretary, Bolton and District Hospital Management Committee, The Royal Infirmary, Bolton.

MANCHESTER VICTORIA MEMORIAL JEWISH HOS-PITAL. (Non-sectarian—104 Beds.) Applications are invited for the resident post of SENIOR HOUSE OFFICER in Surgery to act as Deputy Resident Surgical Officer. Vacant 11th September. Recognised for F.R.C.S.

Applications immediately with full details and names of 2 referees to Group Secretary, North Manchester Hospital Management Committee, Crumpsall Hospital, Manchester, 8.

MANCHESTER. CRUMPSALL HOSPITAL. (Acute— 1225 Beds.) NORTH MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of REGISTRAR in the Department of Neurosurgery at the above Hospital. The holder of the post will be allowed more scope than is usual in larger departments.

Applications, with full details and the names of 2 referees to Group Secretary, Crumpsall Hospital, Manchester, 8.

MERTHYR GENERAL HOSPITAL. (120 Beds. Recognised for F.R.C.S. (Eng.)) MERTHYR AND ABERDARE HOSPITAL MANAGEMENT COMMITTEE. RESIDENT SENIOR HOUSE OFFICER (surgical). The post offers an excellent all-round experience in general surgery. National Health Service salary and conditions of service.

Applications, with copies of 2 testimonials, to the Group Secretary, Merthyr and Aberdare Hospital Management Committee, St. Tydfil's Hospital, Merthyr Tydfil.

MUSSELBURGH, MIDLOTHIAN. EDENHALL HOS-PITAL. (221 Beds.) ASTLEY AINSLIE EDENHALL AND ASSOCIATED HOSPITALS BOARD OF MANAGEMENT. Applications are invited for the appointment of SENIOR HOUSE OFFICER (general medical), vacancy 1st October, 1955.

Applications, stating age, experience and copies of recent testimonials to the Medical Superintendent.

NEWARK GENERAL HOSPITAL, Newark. (82 Beds.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT SURGICAL OFFICER with general duties required at Registrar rate of pay. Post becomes vacant 1st October, 1955. This post offers good experience to anyone preparing to enter general practice. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 29th August, 1955, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

MITCHAM. WILSON HOSPITAL, Cranmer-road, MITCHAM, SURREY. RESIDENT SENIOR HOUSE SURGEON. Vacant end of August. This post in small but busy general hospital provides good and varied experience in diagnosis, treatment and operative procedure.

Applications, stating age, qualifications and experience, and the names of referees, to be sent to the Group Secretary, St. Helier Hospital, Carshalton, Surrey.

NEWCASTLE GENERAL HOSPITAL. (838 Beds.) NEWCASTLE UPON TYNE HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (resident) required in the Orthopædic Department. Post offers good experience under Consultant Orthopædic Surgeons.

Applications should be sent addressed to the Secretary, Newcastle General Hospital, Westgate-road, Newcastle upon Tyne, 4.

NEWCASTLE REGIONAL HOSPITAL BOARD. ST. GEORGE'S HOSPITAL, MORPETH. (1200 Beds.) SENIOR REGISTRAR PSYCHIATRIST (resident), whole-time. Candidates should normally have previous experience in psychiatry, but applications will be considered from candidates with no previous practical experience in psychiatry who hold a higher medical qualification, have had wide experience in general medicine and intend to obtain a D.P.M. and specialise in psychiatry. Arrangements can be made for the person appointed to take the necessary course of study for the Durham D.P.M. A small 3-roomed furnished, or unfurnished, flat is available. Appointment for 1 year initially and subject to annual review up to 4 years duration. Further particulars from Medical Superintendent.

Applications with names and addresses of 3 referees to Regional Psychiatrist, Newcastle Regional Hospital Board, Walkergate Hospital, Benfield-road, Newcastle upon Tyne 6, within 21 days.

NEWCASTLE UPON TYNE. THE UNITED NEWCASTLE UPON TYNE HOSPITALS. Applications are invited for the whole-time non-resident appointment of REGISTRAR in the Department of Radiology (diagnostic). Candidates should preferably possess a recognised diploma in Radiology or hold the M.R.C.P. or F.R.C.S. The appointment is for 1 year in the first instance tenable at the Royal Victoria Infirmary, and if an extension of 1 year is granted the appointee may be required to undertake duty in a hospital under the Newcastle Regional Hospital Board. The appointment will be subject to terms and conditions of service of hospital medical staff in the National Health Service.

Applications, giving full details and the names and addresses of 3 referees, should be sent to the undersigned within 2 weeks of the date of appearance of this advertisement.

A. W. SANDERSON, House Governor and Secretary.
Royal Victoria Infirmary, Newcastle upon Tyne.

NEWPORT, ISLE OF WIGHT. ST. MARY'S HOSPITAL. (350 Beds.) ISLE OF WIGHT GROUP HOSPITAL MANAGEMENT COMMITTEE. RESIDENT HOUSE SURGEON. Post vacant now. Approved for Pre-registration Service, and recognised for F.R.C.S.

Applications, with names of 2 referees, to Hospital Secretary, as soon as possible.

NEWPORT, MONMOUTHSHIRE. ROYAL GWENT HOSPITAL. (260 Beds. Recognised F.F.A.R.C.S. and D.A.) SENIOR HOUSE OFFICER in Anæsthetics required. Non-resident. Previous experience in specialty not essential. The successful candidate will receive a thorough training in the specialty and will also attend the other General Hospital nearby in Newport with the Consultants. Good and varied experience Salary £745.

Write, quoting 2 referees, to T. A. JONES, Group Secretary. 64, Cardiff-road, Newport, Mon.

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Whole-time REGISTRAR in Dermatology, based on West Middlesex Hospital, Isleworth (1142 Beds). Duties will include also clinics at hospitals in the Uxbridge, Staines, and Windsor Groups. Appointment for 1 year in first instance. Hospital may be visited by direct appointment.

Application forms obtainable from, and returnable to, Group Secretary, South West Middlesex Group Hospital Management Committee, West Middlesex Hospital, Isleworth, by 30th August, 1955.

NORTHAMPTON. ST. CRISPIN HOSPITAL, Duston, NORTHAMPTON. (1250 Beds.) SENIOR HOUSE OFFICER required. Salary according to National scale. The Hospital is approved for training for the D.P.M. of the Conjoint Board and facilities are available in child psychiatry and outpatient clinics locally, and in neurology (at Oxford). There is a modern admission unit and an annual admission-rate of 700 patients per annum. Regular case conferences are held.

Applications, giving full details and names of 3 referees, to be sent to the Physician-Superintendent by 31st August, 1955.

NOTTINGHAM CHILDREN'S HOSPITAL. (136 Beds.) (Recognised for the D.C.H.) Applications are invited for the post of RESIDENT HOUSE SURGEON (casualty) (pre-registration), which falls vacant early in September. The post is tenable for 6 months.

Applications, with copies of 2 testimonials, should be sent to the Secretary, Nottingham Children's Hospital, Chestnut-grove, Nottingham.

NOTTINGHAM. PLASTIC SURGERY, JAW INJURIES AND BURNS CENTRE, CITY HOSPITAL, NOTTINGHAM. SENIOR HOUSE OFFICER in Plastic Surgery. Previous experience in specialty not essential. The successful candidate will receive a thorough training in plastic surgery and burns. Hospital intakes from Nottingham and Derby areas. Salary £745, less £150 board-residence.

Applications, together with copies of 3 recent testimonials, should be forwarded to the Hospital Secretary, City Hospital, Hucknall-road, Nottingham.

NOTTINGHAM. CITY HOSPITAL. (804 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (medical). Post vacant 1st October. The appointment will be for 1 year.

Applications, stating age, nationality, qualifications and experience, together with copies of not more than 3 testimonials to be sent immediately to the Hospital Secretary, City Hospital, Hucknall-road, Nottingham, from whom particulars may be obtained.

NOTTINGHAM. CITY HOSPITAL. (804 Beds.) Sheffield REGIONAL HOSPITAL BOARD. Whole-time RESIDENT REGISTRAR (thoracic surgery) required. Appointment for 1 year in first instance. Thoracic Unit at City Hospital undertakes non-tuberculosis and cardiological cases; tuberculosis surgery undertaken at modern unit in nearby sanatorium, appointee encouraged to attend. Previous surgical experience desirable.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 29th August, 1955, giving age, nationality, present and previous appointments with dates, naming 3 referees.

NOTTINGHAM GENERAL HOSPITAL. Applications are invited from registered medical practitioners for the post of SENIOR ORTHOPÆDIC AND FRACTURE HOUSE OFFICER, duties to commence about end August. The post offers exceptional experience in traumatic surgery. Salary and conditions of service in accordance with Ministry Regulations.

Applications, stating age, qualifications and experience, nationality, &c., together with copies of testimonials, to be sent to the Group Secretary.

NOTTINGHAM GENERAL HOSPITAL. Required, SENIOR HOUSE OFFICER (medical) for the above Hospital, duties to commence on or about 14th September, 1955. 40 acute medical beds (mainly cardiological) in Department. Salary and conditions of service in accordance with Ministry regulations.

Applications, stating age, qualifications and experience, together with copies of testimonials, to be sent to—

General Hospital, Nottingham. HENRY M. STANLEY.

PAISLEY. I.D. HOSPITAL, Hawkhead-road. Junior HOSPITAL MEDICAL OFFICER required.

Applications to Group Medical Superintendent, Royal Alexandra Infirmary, Paisley.

PLYMOUTH, SOUTH DEVON AND EAST CORNWALL GENERAL HOSPITAL GROUP. AREA PATHOLOGICAL DEPARTMENT. Applications invited from duly qualified and registered medical practitioners for the appointment of RESIDENT SENIOR HOUSE OFFICER in Pathology, vacant 1st September, 1955. The appointment will be for a period of 12 months, in the Area Laboratory at the South Devon and East Cornwall Hospital, Greenbank-road, Plymouth, which provides excellent modern working facilities.

Applications, stating age, nationality, qualifications, and experience, together with the names and addresses of 3 referees, to be sent to ARTHUR R. CASH, Group Secretary.
7, Nelson-gardens, Stoke, Plymouth.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL HOSPITAL.

SENIOR HOUSE OFFICER in Casualty and Traumatic Department, Freedom Fields Section, vacant immediately.

Applications, stating age, nationality, qualifications and experience, with names of 3 referees, to be sent to—

ARTHUR R. CASH, Group Secretary, Plymouth,
South Devon and East Cornwall General Hospital Group.
7, Nelson-gardens, Stoke, Plymouth.

PONTEFRACT GENERAL INFIRMARY. House Officers (medical and surgical) required immediately. These are approved pre-registration posts under Medical Act, 1950, but applications will be considered from fully registered practitioners. Hospital approved under F.R.C.S. regulations, and provides excellent medical and surgical experience. Married accommodation available.

Apply at once to Secretary, Pontefract and Castleford Hospital Management Committee, Great Northern House, Salter-row, Pontefract, Yorks.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE.

Royal Portsmouth Hospital (104 orthopædic and 70 surgical beds)

SENIOR HOUSE OFFICER (orthopædic), vacant 31st August.

HOUSE OFFICER (orthopædic), vacant 31st August. Pre-registration post.

SENIOR HOUSE SURGEON, vacant 21st September.

Applications, stating age, experience and qualifications, together with names of 2 referees, should be forwarded as soon as possible to L. C. ROGERS.
35, Grove-road South, Southsea.

POOLE GENERAL HOSPITAL, Poole, Dorset. Bournemouth AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. CASUALTY OFFICER (Senior House Officer) required for 12 months from 1st October, 1955. Post suitable for persons reading for higher diplomas.

Applications to the Hospital Secretary.

RAMSGATE. GENERAL HOSPITAL. (101 Beds.) SENIOR HOUSE OFFICER (surgical). Recognised for F.R.C.S. and D.A. Salary £745 p.a., less charge for residential emoluments.

Applications, with copies of testimonials, to Hospital Secretary.

RICHMOND, SURREY. ROYAL HOSPITAL. Locum HOUSE PHYSICIAN required. Must have completed first 6 months. Vacant from 1st September for 1 or 2 weeks.

Apply to Administrative Officer.

ROCHDALE INFIRMARY. House Officers (surgery), posts now vacant at above Hospital. Pre-registration candidates eligible for these posts which are recognised for 6 months F.R.C.S. experience.

Apply at once to Group Secretary, Central Offices, Birch Hill Hospital, Rochdale.

READING. BATTLE HOSPITAL. (374 Beds.) Applications are invited from registered and provisionally registered medical practitioners for post of RESIDENT JUNIOR HOUSE SURGEON in the Area Accident and Orthopædic Department, vacant 1st October, 1955. F.R.C.S. recognised. Also casualty duties. Salary £425–£525 p.a., less £125 board-residence.

Apply, stating age, qualifications with dates, nationality, present position, with copy of 1 recent testimonial, to Hospital Secretary.

RHYL. ROYAL ALEXANDRA HOSPITAL. (138 Beds.) Applications are invited for appointment of HOUSE PHYSICIAN at the above Hospital. Vacant 30th September, 1955.

Applications, stating age, qualifications and experience, with copies of 2 recent testimonials, to be sent immediately to the Group Secretary, Clwyd and Deeside Hospital Management Committee, "Rhianfa," Russell-road, Rhyl.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) ORTHOPÆDIC HOUSE SURGEON (resident) required in the Orthopædic and Accident Unit immediately. The service consists of 100 Beds equally divided between traumatic surgery and "cold" orthopædics. Post is recognised for pre-registration purposes and for F.R.C.S.

Applications to be sent to Group Secretary, Romford Hospital Management Committee, Oldchurch Hospital, as soon as possible.

ROMFORD. RUSH GREEN HOSPITAL. (301 Beds.) RESIDENT SENIOR HOUSE SURGEON required from 1st October, 1955. Recognised for F.R.C.S. (No married quarters available.)

Applications should be forwarded immediately to Medical Superintendent, stating also names of 2 referees.

ROMFORD, ESSEX. VICTORIA HOSPITAL. (99 Beds.) RESIDENT HOUSE PHYSICIAN (Male) required. Post not approved for pre-registration purposes.

Applications should be forwarded immediately to the Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

SCUNTHORPE. WAR MEMORIAL HOSPITAL. (267 Beds.) SCUNTHORPE HOSPITAL MANAGEMENT COMMITTEE. Vacancy for HOUSE PHYSICIAN (resident) end September. Grade Senior House Officer or pre-registration. Busy department with large outpatient section offering good experience.

Applications, naming 2 referees, to Group Secretary.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS. Applications are invited for the post of SURGICAL REGISTRAR. Post vacant 17th November, 1955. The successful candidate will work on a rotation basis between the Royal Infirmary and the Children's Hospital Units. It is intended, if possible, that the holder of the post will spend equal periods in the Orthopædic Department and on each of 2 surgical firms at the Royal Infirmary; and for a period at the Children's Hospital.

Applications, stating age, qualifications and experience with the names of 3 referees, should be sent not later than 31st August, 1955, to the Chief Administrative Officer, The United Sheffield Hospitals, West-street, Sheffield, 1.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS. ROYAL HOSPITAL UNIT. Applications are invited from practitioners who have completed at least 4 years as a Senior Registrar in general surgery for the post of SENIOR SURGICAL REGISTRAR at the above Hospital. Special facilities will be afforded for experience in urology and the person appointed will also act as First Assistant in a general surgical firm. The appointment is for 1 year in the first instance and may be extended for a further year.

Applications, stating age, qualifications and experience, with the names of 3 referees, should be sent by 26th August, 1955, to the Chief Administrative Officer, The United Sheffield Hospitals, West-street, Sheffield, 1.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS. Applications are invited for the following non-resident posts at the Royal Hospital Unit:—

(*a*) OPHTHALMIC REGISTRAR.
(*b*) ORTHOPÆDIC REGISTRAR.

Applications stating age, qualifications and experience, with the names of 3 referees, should be sent immediately to the Chief Administrative Officer, The United Sheffield Hospitals, West-street, Sheffield, 1.

SHREWSBURY. ROYAL SALOP INFIRMARY/COPTHORNE HOSPITAL. (509 Beds.) SHREWSBURY HOSPITAL GROUP. HOUSE SURGEON required immediately. Pre-registration candidates eligible.

Applications, with copy testimonials, to Group Secretary, Royal Salop Infirmary, Shrewsbury.

SKIPTON (near). THE HOSPITAL, Grassington, near SKIPTON. Applications invited for RESIDENT MEDICAL OFFICER at the Hospital, Grassington, near Skipton. Appointment is that of Senior House Officer or Junior Hospital Medical Officer, according to experience. The Hospital caters for tuberculous patients, men and women.

Apply to Medical Superintendent.

SLOUGH, BUCKINGHAMSHIRE. UPTON HOSPITAL. Locum SENIOR HOUSE OFFICER (gynæcological) required 5th September–18th September.

Applications, stating age and qualifications together with 2 testimonials, to Hospital Secretary.

SLOUGH, BUCKINGHAMSHIRE. UPTON HOSPITAL. Locum CASUALTY REGISTRAR required 29th August–4th September.

Applications, stating age and qualifications together with 2 testimonials, to Hospital Secretary.

SLOUGH, BUCKINGHAMSHIRE. UPTON HOSPITAL. HOUSE OFFICER (casualty) required, 1 of 2, for busy Casualty Department. Experience provided in orthopædic and plastic cases.

Applications, stating age and qualifications together with copies of 2 testimonials, to Hospital Secretary.

SLOUGH, BUCKINGHAMSHIRE. UPTON HOSPITAL. Locum HOUSE OFFICER (casualty) required immediately.

Applications, stating age and qualifications together with 2 testimonials, to Hospital Secretary.

SALISBURY GENERAL HOSPITAL. Applications are invited for the post of Locum RESIDENT or NON-RESIDENT CASUALTY OFFICER (Senior House Officer) for a period of 2 months from 29th August to 29th October.

Applications, naming 2 referees, to Group Secretary, Salisbury Group Hospital Management Committee, Odstock Hospital, Salisbury, Wilts.

SALISBURY GENERAL HOSPITAL. Salisbury Group HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE OFFICER to the E.N.T. Department. Post is recognised for D.L.O. and F.R.C.S. and is vacant September, 1955.

Applications, naming 2 referees, to Group Secretary, Odstock Hospital, Salisbury, Wilts.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. Applications are invited for a whole-time appointment from 1st October, 1955, till 31st December, 1956, of a Transitional SENIOR REGISTRAR in Surgery to the Edinburgh Southern Group of hospitals. The salary will be at the rate of £1400 p.a., and the person appointed should have already completed the greater part of his Senior Registrar training in surgery.

Applications, giving particulars of age, qualifications and previous experience, together with the names of 3 referees, should be submitted to the Secretary, South-Eastern Regional Hospital Board, Scotland, 11, Drumsheugh-gardens, Edinburgh, by 10th September, 1955.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of a SENIOR REGISTRAR in Diseases of the Chest for duties in the first place with the Edinburgh Royal Victoria and Associated Hospitals. The post will be associated with the Department of Tuberculosis and Diseases of the Chest, Edinburgh University. The duties in the first place will be concerned mainly with tuberculosis but there will later be an opportunity for training in non-tuberculous diseases of the chest.

Applications, giving particulars of age, qualifications and previous experience, together with the names of 3 referees, should be submitted to the Secretary, South-Eastern Regional Hospital Board, 11, Drumsheugh-gardens, Edinburgh, 3, by 10th September, 1955.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. Applications are invited for the whole-time appointment of Transitional SENIOR REGISTRAR in Medicine at the Northern Hospital, Dunfermline, from 1st November, 1955, to 31st December, 1956. The salary will be at the rate of £1400 p.a. and the person appointed should have already completed the greater part of his senior registrar training in medicine.

Applications, giving particulars of age, qualifications and previous experience, together with the names of 3 referees, should be submitted to the Secretary, South-Eastern Regional Hospital Board, Scotland, 11, Drumsheugh-gardens, Edinburgh, 3, by 10th September.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the following appointments, which will be for 1 year in the first instance:—

SENIOR REGISTRAR in Medicine based at the Western Infirmary, Glasgow, with an attachment to the University Department of Medicine and participation in the work of the Isotope Unit there.

REGISTRAR in Surgery for duties in the Neurosurgical Unit, Killearn Hospital, near Glasgow.

REGISTRAR in Orthopædics based at the Royal Hospital for Sick Children with duties which will be associated on a rotating basis with the Orthopædic Department of the Western Infirmary, Glasgow.

REGISTRAR in Obstetrics and Gynæcology based at Stirling Royal Infirmary.

These appointments are subject to the National Health Service (Scotland) superannuation regulations.

Applications (12 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, by 10th September, 1955.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. WEST DORSET GROUP HOSPITAL MANAGEMENT COMMITTEE. PATHOLOGICAL REGISTRAR (preferably resident) required mid-October. General laboratory and emergency duties. Some laboratory experience essential. Salary on Registrar grade, less £160 p.a. if resident. Candidates may visit the Laboratory by appointment.

Application form, to be returned by 27th August, 1955, from Group Secretary, West Dorset Hospital Management Committee, Damers-road, Dorchester, Dorset.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of SENIOR REGISTRAR in Chest Medicine to the tuberculosis early treatment and assessment unit of 96 Beds shortly to be transferred from Kettlewell Hospital, Swanley, Kent, to Joyce Green Hospital in the Dartford Group. The duties will be both inpatient and in chest clinics associated with the unit in both the Dartford, and Sidcup and Swanley Groups of hospitals. Candidates must have had wide experience in general medicine and in the diagnosis and treatment of pulmonary tuberculosis. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales), and will be for 1 year in the first instance.

Applications, giving particulars of age, qualifications and experience with relevant dates, together with the names and addresses of 3 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, not later than 3rd September, 1955.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as Whole-time REGISTRAR in Anæsthetics to fill a vacancy in the approved trainee establishment at the Orpington and Sevenoaks Group of hospitals, available on 1st November, 1955. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales), and will be for 1 year in the first instance.

Applications, giving particulars of age, qualifications and experience with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, London, W.1, not later than 3rd September, 1955.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as Whole-time REGISTRAR in Obstetrics and Gynæcology to fill a vacancy in the approved trainee establishment at the Medway and Gravesend Group of hospitals for duties mainly at All Saints Hospital, Chatham, Kent. The post is recognised for the M.R.C.O.G. The appointment will be available from 1st October, 1955, and will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales), and will be for 1 year in the first instance.

Applications, giving particulars of age, qualifications and experience with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, London, W.1, not later than 3rd September, 1955.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as Whole-time REGISTRAR in Chest Diseases to fill a vacancy in the approved trainee establishment at the Brighton and Lewes Group of hospitals, for duty mainly at Bevendean Hospital, Bear-road, Brighton, 1, which is a unit of approximately 150 Beds devoted to the active treatment of tuberculosis, and also at chest clinics in the area. Candidates must have had good experience in general medicine and in the diagnosis and treatment of pulmonary tuberculosis in adults. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales) and will be for 1 year in the first instance.

Applications, giving particulars of age, qualifications and experience with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, London, W.1, not later than 3rd September, 1955.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL (278 Beds), AND SOUTHAMPTON GENERAL HOSPITAL (471 Beds). SENIOR HOUSE OFFICER (E.N.T.) required from 4th September. This post is recognised for the F.R.C.S. (Eng.) and D.L.O. examinations and provides experience in all branches of E.N.T. work, including audiometry. The Group includes a diagnostic and distributing hearing-aid centre.

Applications, with copies of recent testimonials, should be forwarded as soon as possible to the Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL. (278 Beds.) CASUALTY OFFICER (Senior House Officer), orthopædic, required for the above Hospital (Orthopædic Unit 74 Beds) in August. This Hospital is the centre to which all trauma from a large industrial town and port is directed, thus providing excellent experience in the treatment of traumatic conditions.

Applications, with copies of testimonials, to be submitted as soon as possible to the Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

ST. ALBANS CITY HOSPITAL, St. Albans, Hertfordshire. (384 Beds.) Locum Tenens HOUSE SURGEON (House Officer grade) required for 1 of the 2 general surgical teams for the period 3rd—10th September, 1955, both dates inclusive.

Applications, giving age, qualifications and experience, should be forwarded immediately to the Group Secretary, Mid Herts Group Hospital Management Committee, Bleak House, Catherine-street, St. Albans.

ST. ALBANS CITY HOSPITAL, St. Albans, Hertfordshire. (384 Beds.) Locum Tenens RESIDENT JUNIOR HOSPITAL MEDICAL OFFICER in Gynæcology and Obstetrics required for duties mainly at the above Hospital for the period 29th August–14th September, 1955, inclusive of both dates.

Applications giving age, qualifications and experience, should be forwarded immediately to the Group Secretary, Mid Herts Group Hospital Management Committee, Bleak House, Catherine-street, St. Albans.

ST. HELENS HOSPITAL. (196 Beds.) Applications are invited for the post of CASUALTY OFFICER in the Senior House Officer grade, at above Hospital. The post is approved for the 6 months training in casualty work required of candidates for the Fellowship examination of the Royal College of Surgeons.

Applications, stating age, qualifications and experience, and giving 2 names for reference, should be forwarded immediately to—

N. RICHARDS, Secretary,
St. Helens and District Hospital Management Committee,
Group Office, Whiston Hospital, Prescot.

STAFFORD HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (anæsthetics), Male or Female. Recognised for D.A.

Applications, with copy testimonials, to Group Secretary, 13, Foregate-street, Stafford.

STRATFORD-ON-AVON HOSPITAL. Locum Registrar in General Surgery required at above Hospital from 10th September for approximately 4 weeks.

Apply Hospital Secretary.

STOCKPORT INFIRMARY. (162 Beds.) Stockport and BUXTON HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the pre-registration post of HOUSE OFFICER (general surgery and ophthalmology). Recognised for the F.R.C.S. and D.O.M.S.

Applications, stating age, qualifications and experience, together with copies of 2 testimonials, to be addressed to the Group Secretary, 59B, Shaw-heath, Stockport.

STOKE-ON-TRENT. CITY GENERAL HOSPITAL. (845 Beds—Recognised for F.F.A. and D.A.) STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER in Anæsthetics, vacant 1st October, 1955. Previous anæsthetic experience desirable, but not essential. The post offers experience in anæsthesia for all types of general surgery, thoracic, and cardiac surgery, including an Obstetric Unit of 60 Beds. Staff includes a Senior Registrar, who shares in emergency duties.

Applications, with necessary details and copy testimonials, to the Group Secretary, Stoke-on-Trent Hospital Management Committee, Princes-road, Stoke-on-Trent.

SULLY HOSPITAL, Sully, Penarth, Glamorganshire. SENIOR HOUSE OFFICER (surgical) required at above Hospital. Experience available in investigation and treatment of all lung and heart diseases in adults and children.

Form of application from Group Secretary, Cardiff Hospital Management Committee, 44, Cathedral-road, Cardiff.

SWANSEA HOSPITAL, Swansea. (407 Beds.) Glantawe HOSPITAL MANAGEMENT COMMITTEE. Registered medical practitioners are invited to apply for the resident appointment of SENIOR HOUSE OFFICER in the Traumatic and Orthopædic Department of the above Hospital. Vacancy approximately 1st September. The post is recognised under the F.R.C.S. regulations for 6 months casualty training.

Applications, stating age and experience, together with copies of 2 recent testimonials, should be forwarded to the Hospital Secretary.

SWANSEA. MOUNT PLEASANT HOSPITAL. (238 sick beds.) GLANTAWE HOSPITAL MANAGEMENT COMMITTEE. Registered medical practitioners are invited to apply for the resident appointment of JUNIOR HOSPITAL MEDICAL OFFICER (Female) for work in the Medical and Surgical Departments, and in the Chronic Sick Wards of the above Hospital.

Applications, stating age, experience and qualifications, with copies of 2 recent testimonials, should be addressed to the Hospital Secretary.

TAPLOW, near MAIDENHEAD. CANADIAN RED CROSS MEMORIAL HOSPITAL. REGISTRAR required to the Special Unit for research in juvenile rheumatism at the above Hospital. Post offers scope for those interested in research, pædiatrics, rheumatology, or cardiology. Hospital may be visited by direct appointment.

Application forms obtainable from and returnable to Group Secretary, Windsor Group Hospital Management Committee, Alma-road, Windsor, by 26th August.

TAPLOW, near MAIDENHEAD. CANADIAN RED CROSS MEMORIAL HOSPITAL. HOUSE PHYSICIAN required to Special Unit for research in juvenile rheumatism, vacant 10th October. Post offers scope for those interested in research, pædiatrics, rheumatology or cardiology.

Applications, stating age, qualifications and experience, with copies of 2 testimonials, to Hospital Secretary.

TAUNTON HOSPITAL MANAGEMENT COMMITTEE. TAUNTON AND SOMERSET HOSPITAL. Applications are invited for SENIOR HOUSE OFFICER (pathology), vacant from 22nd August, 1955. Not recognised for pre-registration candidates.

Applications, stating age, nationality and qualifications, together with the names of 2 referees, should be forwarded immediately to reach the Group Secretary, Taunton and Somerset Hospital, Musgrove Park Branch, Taunton, Somerset.

TUNBRIDGE WELLS (near). PEMBURY HOSPITAL, PEMBURY. TUNBRIDGE WELLS GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications invited for post of RESIDENT ANÆSTHETIST (Senior House Officer). Post vacant 1st November, 1955, and tenable for 12 months in first instance, is recognised for D.A. and F.F.A.R.C.S. National Health Service salary, less £150 for board and lodging, &c.

Apply to Group Secretary, Sherwood Park, Pembury-road, Tunbridge Wells.

WARRINGTON GENERAL HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER (pædiatrics), Male or Female, which is now vacant. Post recognised for D.C.H. Scale of salary £745 p.a., less £130 for residential emoluments.

Applications to be forwarded to—

H. L. BOOT, Group Secretary,
Warrington and District Hospital Management Committee.
c/o General Hospital, Warrington, Lancs.

WATFORD. SHRODELLS HOSPITAL. (420 Beds.) Applications are invited for the post of GYNÆCOLOGICAL HOUSE OFFICER, pre- or post-registration. If held by a registered medical practitioner the post will be paid on Junior Hospital Medical Officer scale.

Applications, together with copies of 2 testimonials, to reach the Medical Officer-in-charge as soon as possible.

WELSH REGIONAL HOSPITAL BOARD. Registrar (pædiatrics), Morriston Hospital, Morriston, near Swansea. Resident. Subject to review end of first year.

Application forms from Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 14 days.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOSPITAL. (311 Beds.) SENIOR HOUSE OFFICER (orthopædics) required. Post recognised F.R.C.S. Wide experience available under Area Orthopædic team. Appointment for 6 months in first instance. Vacant 8th September.

Applications, with copies of 2 testimonials, to the Secretary.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOSPITAL. (311 Beds.) CASUALTY OFFICER (Senior House Officer grade), vacant 1st September. Post recognised for the F.R.C.S. The appointment will be for 6 months in the first instance.

Applications, with copies of 2 testimonials, should be sent to the Secretary.

WINDSOR CHEST CLINIC. Registrar required at above Clinic for post vacant early November. Good training in general medicine essential, and special experience in chest diseases desirable. This Clinic, which may be visited by direct arrangement with Physician-in-charge, has 50 Beds attached, and is in close contact with Harefield and Pinewood Chest Hospitals.

Application forms obtainable from, and returnable to, Secretary, Windsor Group Hospital Management Committee, Aima-road, Windsor, by 4th September.

WOLVERHAMPTON GROUP. ROYAL HOSPITAL. JUNIOR PATHOLOGIST required. Salary in Junior Hospital Medical Officer grade. Comprehensive service offering wide experience and training. Resident post. Vacant 31st August. Candidates may visit hospitals.

Applications to Group Secretary, The Royal Hospital, Wolverhampton.

WOLVERHAMPTON GROUP.

The Royal Hospital (an Associated Hospital of the University of Birmingham Medical School)

SENIOR HOUSE OFFICER or HOUSE OFFICER (Fracture and Orthopaedic Department), vacant now.

2 SENIOR HOUSE OFFICERS (Anæsthetists). Appointments recognised for D.A. and F.F.A.R.C.S. Vacant October and November.

New Cross Hospital

HOUSE OFFICER (general surgery), vacant 19th September. Pre-registration post.

Apply, with copies of testimonials, to Secretary, The Royal Hospital, Wolverhampton.

WORCESTER ROYAL INFIRMARY. (213 Beds.) Senior HOUSE OFFICER (surgical) required at the end of September. The post is recognised for F.R.C.S. and is the senior of the resident posts, offering wide experience in surgery.

Applications, with names and addresses of 2 referees, to the Secretary.

WORTHING GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of Whole-time REGISTRAR in Chest Diseases which becomes vacant early September. Duties at Worthing, Southlands, and Horsham Hospitals (3 general hospitals) and Swandean Hospital, Worthing (T.B.). Previous chest experience necessary. Car essential.

Forms of application are available from the undersigned.

A. V. OAKTON, Group Secretary.

129, Brighton-road, Worthing, Sussex.

CHANNEL ISLANDS, JERSEY. GENERAL HOSPITAL. Applications are invited for the post of CASUALTY OFFICER which is now vacant in the above Hospital. The appointment is for 12 months, but is renewable for a further 12 months. Salary £850 p.a., less £125 for residential emoluments.

Applications to be submitted not later than 31st August, 1955, to the President, Public Health Committee, General Hospital, Jersey, C.I.

Public Appointments

BAHRAIN, PERSIAN GULF. GOVERNMENT OF BAHRAIN MEDICAL DEPARTMENT invite applications from British Women Doctors, F.R.C.S., for the post of SURGEON to the Women's Hospital. Age 28–40. Minimum salary £1694 rising £45 annually, no allowances. Non-contributory gratuity on retirement. Private practice among Europeans only. No income-tax. Free quarters with hard furniture and car. Agreement for 2 years, renewable, with 5 months home leave on full pay and free air passages.

Applications, with 3 testimonials and a photograph, should be addressed to Messrs. CHARLES KENDALL & PARTNERS LTD., 7, Albert-court, Kensington Gore, London, S.W.7.

COVENTRY CORPORATION. Deputy Medical Officer OF HEALTH AND DEPUTY PRINCIPAL SCHOOL MEDICAL OFFICER required by Coventry Corporation. Salary £1600–£1850 according to service and experience. Applicants must be registered medical practitioners holding in addition a degree in sanitary science, public health or state medicine. Housing accommodation may be provided.

Full details from Medical Officer of Health, Council Offices, Earl-street, South Side, Coventry. Applications, with 2 recent testimonials and names of 2 referees, to the Town Clerk, Council House, Coventry, by 5th September, 1955.

DURHAM. COUNTY COUNCIL OF DURHAM. Applications are invited from registered medical practitioners (Men and Women) for appointment as SCHOOL MEDICAL OFFICERS to act under the direction of the Deputy Principal School Medical Officer. Applicants must have had at least 3 years experience in the practice of their profession and the possession of a Diploma in Public Health is desirable. Salary scale £975–£50–£1375 p.a.

Conditions of appointment and forms of application may be obtained from the undersigned, to whom completed application forms must be returned not later than 5th September, 1955.

G. H. METCALFE, Director of Education.

Shire Hall, Durham, 8th August, 1955.

LANCASHIRE COUNTY COUNCIL. Registered medical practitioners required for appointment of ASSISTANT DIVISIONAL MEDICAL OFFICERS in Administrative County Areas adjacent to Liverpool, adjacent to Wigan and at Leigh B. Possession of D.P.H. desirable. Salary £975–£1375 p.a. Travelling and subsistence allowances where applicable.

Application forms and further particulars from County Medical Officer of Health, Serial 285, East Cliff County Offices, Preston.

LANCASHIRE COUNTY COUNCIL. Divisional Medical OFFICER (Health Division No. 3—Kirkham). Applicants must be medical practitioners holding D.P.H. or equivalent qualification and with administrative experience. Will be required to act as Medical Officer of Health to the County Districts within the Division where they so desire. The basic salary as Divisional Medical Officer will be in accordance with Whitley Council award. This scale will be substantially increased if the Divisional Medical Officer is appointed Medical Officer of Health to 1 or more County Districts. The present combined salary scale appertaining to this appointment is £1739 1s. 10d.–£2117 5s. 5d. The appointment is superannuable and subject to passing a medical examination.

Full particulars and application form from County Medical Officer (Serial No. 276), East Cliff County Offices, Preston, to be returned by 29th August, 1955.

LINCOLN. CITY AND COUNTY OF THE CITY OF LINCOLN. Appointment of DEPUTY MEDICAL OFFICER OF HEALTH AND DEPUTY PRINCIPAL SCHOOL MEDICAL OFFICER. Applications are invited for this appointment from persons holding the D.P.H., or its equivalent, with previous experience in the Public Health, School Health and Maternity and Child Welfare Services. The post is superannuable. Medical examination required. The salary is on a scale of £1150–£50–£1350 p.a., commencing at £1250. Car mileage allowance. Housing accommodation available.

Application forms and particulars of conditions of service may be obtained from the Medical Officer of Health, City Health Department, Beaumont Fee, Lincoln, by whom completed applications should be received not later than 17th September, 1955. J. HARPER SMITH, Town Clerk.

Town Clerk's Office, Lincoln, 4th August, 1955.

DERBYSHIRE COUNTY COUNCIL. Appointment of ASSISTANT COUNTY MEDICAL OFFICER OF HEALTH for the Derbyshire County Council AND MEDICAL OFFICER OF HEALTH for Bolsover U.D., Blackwell R.D., and Clowne R.D. Applications are invited from Male or Female registered medical practitioners holding a Diploma in Public Health or an equivalent qualification for the above permanent "mixed" appointment. The total inclusive salary scale will be £1494 17s. 8d. p.a., rising by 4 annual increments of £57 0s. 11d. and 4 of £28 8s. 2d. to £1836 14s. 0d. p.a. A commencing salary in excess of the minimum may be agreed if appropriate. A car allowance is payable. The person appointed will be directly responsible to the respective District Councils for the proper performance of all the duties of a Medical Officer of Health for those areas. As Assistant County Medical Officer he will be concerned, under the direction of the County Medical Officer of Health, with decentralised supervision required under the National Health Service Act, as well as work in connection with the School Health Service, attendance at clinics, and such other duties as may be required. The Officer may be required to live in one of the above-mentioned districts or in Mansfield; sympathetic consideration will be given to the provision of temporary housing accommodation if required. The Officer must not engage in private practice but devote whole-time to the duties of the before-mentioned posts. The appointment is subject to the provisions of the Local Government Superannuation Acts, 1937/53; the successful candidate will be required to pass a medical examination. Canvassing, either directly or indirectly, will be a disqualification.

Application forms may be obtained from the undersigned, to whom they should be returned so that they are received not later than 29th August, 1955.

J. B. S. MORGAN, County Medical Officer.

County Offices, St. Mary's Gate, Derby.

GLOUCESTERSHIRE EDUCATION COMMITTEE. City OF GLOUCESTER EDUCATION COMMITTEE. CHILD GUIDANCE SERVICE. Applications invited from suitably qualified registered medical practitioners for post of PSYCHIATRIST AND MEDICAL DIRECTOR of a Clinic centred at Cheltenham, but with weekly sessions at Gloucester and Stroud. Salary £1415–£50–£1765–£65–£1830, plus subsistence and travelling allowance from the Clinic at Cheltenham in accordance with the County Council's scale.

Further particulars and application form from the County Medical Officer of Health, Berkeley House, Berkeley-street, Gloucester. Applications to be returned within 14 days of the date of this advertisement.

YORKSHIRE. COUNTY COUNCIL OF THE WEST RIDING OF YORKSHIRE. Appointment of ASSISTANT COUNTY MEDICAL OFFICER AND SCHOOL MEDICAL OFFICER. Applications are invited from registered medical practitioners, Men or Women, for posts in the following areas:—

Division No. 18. Brighouse Borough, Elland, and Queensbury and Shelf Urban Districts.

Division No. 20. Colne Valley, Denby Dale, Holmfirth, Kirkburton, Meltham, and Saddleworth Urban Districts.

Division No. 23. Hemsworth Urban and Hemsworth Rural Districts.

The Assistant will be on the staff of the County Medical Officer's Department but will work under the administrative direction of the Divisional Medical Officer for the area. The duties will be mainly clinical in the School Health and Infant Welfare Services, but other County health duties may be included by the Divisional Medical Officer. The scale of salary at present is £950 p.a., rising by annual increments of £50 to £1300 p.a. A minimum of 3 years experience since qualification is desirable and the possession of a Diploma in Child Health will be an advantage. Travelling and subsistence allowances according to the County Council's scale are payable in addition to salary. The posts are superannuable and successful applicants will be required to pass a medical examination as to physical fitness.

Forms of application can be obtained from the undersigned, to whom they should be returned not later than 3rd September, 1955. J. WOOD-WILSON, County Medical Officer.

County Hall, Wakefield.

MIDDLESEX COUNTY COUNCIL. County Health DEPARTMENT. DEPUTY AREA MEDICAL OFFICER required initially in Area No. 4 (Hendon and Finchley) for administrative and clinical duties, mainly in connection with National Health Service and Education Acts. May be required to undertake other duties, e.g., as Deputy Medical Officer of Health for one or both of the Boroughs in the area, in which case any adjustment of salary appropriate would be made. Diploma in Public Health or Child Health an advantage. Whole-time, established, subject to medical assessment and prescribed conditions. Salary £1325–£50–£1725 p.a., subject to adjustment as above.

Apply, stating age, qualifications, experience, names of 2 referees to Area Medical Officer, Town Hall, Hendon, N.W.4, by 2nd September (quote R.48 L.). Canvassing disqualifies.

KENNETH GOODACRE, Clerk of the County Council.

Guildhall, Westminster, S.W.1.

PRISON COMMISSIONERS require Full-time Medical OFFICERS in Prison and Borstal Service (England and Wales). Work includes general medical attention of all prisoners and inmates; making psychiatric assessments, the provision of medical and psychiatric reports and giving evidence in court are important aspects of the work. Surgical and psychotherapeutic units are established at selected centres. Candidates must have attained age of 28; must be fully qualified and registered, and should possess sound knowledge of medical and surgical practice; preference given to those who have postgraduate experience in psychological medicine and possession of D.P.M. considered an advantage. Salary: £1500–£75–£1800–£100–£2100 (minimum linked to age 35, minus £50 for each year below that age and plus one increment for each year above that age but not exceeding 40). Rates are subject to deduction for posts outside London. Salaries of £1500 p.a. and below attract pay supplement of £35 p.a. Appointments are unestablished in first instance but opportunity for establishment through Civil Service Commission later. Unfurnished quarters when available are provided at moderate rental.

Application forms and regulations from B.Y.1114, Appointments Officer, Ministry of Labour and National Service, 1–6, Tavistock-square, London, W.C.1, returnable by 10th September, 1955. No original testimonials should be forwarded.

STAFFORD MUNICIPAL BOROUGH COUNCIL. STAFFORDSHIRE COUNTY COUNCIL. Applications are invited for the separate part-time appointments of MEDICAL OFFICER OF HEALTH of the Municipal Borough of Stafford and MEDICAL OFFICER to the Stafford Area Health Committee of the Staffordshire County Council. The appointments together will constitute whole-time, the allocation being 7 half-days and 4 half-days respectively. The proportionate salary for each appointment is calculated in accordance with the Industrial Court Award No. 2565 and increments will be given for previous service in the same capacity. The actual salaries for each appointment are as follows:—

Medical Officer of Health—Stafford Municipal Borough. £1097 14s. 7d.–£33 8s. 2d.–£1231 7s. 3d. which includes the appropriate fraction of the £100, in respect of the combined appointment.

Medical Officer to Area Health Committee. £631 16s. 4d.–£22 14s. 6/7d. (6) and £29 10s. 11d. (1)–£797 14s. 7d., which includes weighting in respect of the Spens Formula.

The selected candidate will be required to provide a car, for which an allowance will be paid. These appointments will be subject to the provisions of the Local Government Superannuation Acts, 1937 to 1953. The successful candidate will be required to pass a medical examination and to produce his birth certificate. Applicants must be fully qualified medical men with experience in public health duties, and must hold the Diploma of Public Health. The candidate will, as regards his duties as Borough Medical Officer of Health be subject to the sole control and direction of the Corporation and as regards his County Council duties, act under the direction of the County Medical Officer of Health and be required to perform such duties as may from time to time be prescribed. The appointment will be subject to 3 calendar months notice in writing on either side.

Forms of application may be obtained from either of the undersigned and should be returned to the Town Clerk of Stafford not later than 31st August, 1955, together with copies of not more than 3 recent testimonials.

T. BROUGHTON NOWELL, Town Clerk.

Borough Hall, Stafford.

T. H. EVANS, Clerk of the County Council.

County Buildings, Stafford.

SMETHWICK. COUNTY BOROUGH OF SMETHWICK. Applications are invited from registered medical practitioners for the post of DEPUTY MEDICAL OFFICER OF HEALTH AND SCHOOL MEDICAL OFFICER. The duties will consist mainly in work in connection with maternity and child welfare and school medical inspection, but the successful candidate will be required to undertake other public-health work as the Medical Officer of Health may direct, including especially the ascertainment and supervision of handicapped persons. The possession of the Diploma in Public Health or Child Health will be required, and preference will be given to candidates who are approved by the Ministry of Education for the purpose of the ascertainment of educationally subnormal children. The salary will be at the rate of £1291 13s. 4d. p.a., rising by 5 annual increments of £51 10s. to £1549 3s. 4d. p.a. The appointment will be subject to the provisions of the Local Government Superannuation Acts, 1937–1953, and the successful candidate will be required to pass a medical examination. The appointment will be subject to 2 months notice on either side.

Applications, stating age, qualifications and experience, and giving the names of 2 persons to whom reference may be made, should be addressed to the Medical Officer of Health, Hales-lane, Smethwick, by 3rd September, 1955.

12th August, 1955. E. L. TWYCROSS, Town Clerk.

FACTORY DOCTORS. Factories Acts, 1937 and 1948. The following appointment as Appointed Factory Doctor is vacant. Apply to Chief Inspector of Factories, 19, St. James's-square, London, S.W.1.

District	*County*	*Latest date for receipt of applications*
KEIGHLEY	.. YORK ..	.. 3RD SEPTEMBER, 1955

MANCHESTER. CITY OF MANCHESTER EDUCATION COMMITTEE. Applications are invited for the post of MEDICAL OFFICER (school health). Preference will be given to candidates who have had special experience in diseases of children and retinoscopy, and hold D.P.H. or D.C.H. Salary £975—£1375.

Application form and particulars (stamped addressed foolscap envelope) from the Chief Education Officer, P.O. Box 480, Education Offices, Deansgate, Manchester, 3, to be returned by 7th September, 1955.

NOTTINGHAM. CITY OF NOTTINGHAM HEALTH SERVICES. Appointment of Medical LOCUM TENENS. Applications are invited from medical practitioners with experience of maternal and child health for a Locum-tenens appointment from October, 1955, to June, 1956. Salary will be at the rate of £975 p.a.

Applications, accompanied by the names of 2 persons to whom reference may be made, should be sent to the Medical Officer of Health, Huntingdon-street, Nottingham, not later than 3rd September, 1955. T. J. OWEN, Town Clerk.

The Guildhall, Nottingham, August, 1955.

General Practice

For an Executive Council post (England and Wales) apply on form E.C.16A obtainable from the council. Mark envelope "Vacancy."

GOLCAR, near HUDDERSFIELD. Applications are invited for a general medical practice VACANCY in an Urban area, number of patients on list at present 3542 (no dispensing). Part of the practice lies in the area of the Huddersfield Executive Council. House and surgery accommodation available for purchase. Apply on form E.C.16A to the undersigned, from whom further particulars and forms may be obtained. Closing date for applications 2nd September, 1955.

C. H. STABLER, Clerk, Yorks West Riding Executive Council.

5, St. John's North, Wakefield.

Hospital Services: Non-Medical Appointments

EPSOM GROUP HOSPITAL MANAGEMENT COM-MITTEE, EPSOM DISTRICT HOSPITAL, Dorking-road, EPSOM, SURREY. BIOCHEMIST (Senior grade) required with degree in Biochemistry or equivalent and a good knowledge of hospital work to take charge of Department of Biochemistry in new Group Laboratory. Salary scale £835–£1080, plus London weighting.

Applications, stating age, qualifications, experience, present position with names and addresses of 3 referees, should be sent to Group Secretary at above address by 3rd September, 1955.

Miscellaneous

To non-professional posts the Notification of Vacancies Order 1952 applies.

Imperial Chemical Industries Limited has a vacancy for a Biochemist with Ph.D. or equivalent research training under 30 years of age who will be required to conduct research in the field of Chemotherapy. The Company's Research Laboratories are at present situated in the North Manchester area but new Laboratories are now in the course of erection in a rural area about 20 miles South of Manchester.—Applications, with full particulars, should be addressed to the Staff Manager, Imperial Chemical (Pharmaceuticals) Ltd., Fulshaw Hall, Wilmslow, Manchester.

Young Physician, at present in small growing West End practice, is going to commence Diagnostic Clinic. Would like to meet anyone interested.—Address, No. 155, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Hypnotism. Will all Doctors interested in this subject for Medical purposes please write to the Secretary, British Society of Medical Hypnotists, 126, Harley-street, W.1.

Microscopes. Highest prices paid for good modern types. Send or bring your equipment for valuation.—WALLACE HEATON LTD., 127, New Bond-street, W.1.

"Pregnancy Diagnosis by the Xenopus Method," 24-hour service. Send specimen of urine and £1 1s. fee. Hæmatology, Biochemistry. Flame Photometry.—WELBECK BIOLOGICAL LABORATORIES, 26, Park-crescent, Portland-place, W.1 (MUSeum 5386–7).

Applicants for posts requiring testimonials copied or duplicated should communicate with MANTON SECRETARIAL SERVICE LTD., 98, Victoria-street, S.W.1 (Phone: VICtoria 0141), who are specialists in this kind of work.

For Sale. 2 only brand new bronchoscope sets, each in special case complete with all fittings by famous makers at well below cost price.—J. & S. FRANKLIN LTD., 138, Strand, W.C.2 (TEM. 5746/7).

New theatre gowns, best quality white drill. 10s. 6d. each, post paid, or special price for quantities.—J. & S. FRANKLIN LTD., 138, Strand, W.C.2 (TEM. 5746/7).

Operating table, A. & H. (about 1933), can be seen at Stratford-on-Avon Hospital, Stratford-on-Avon.—Offers to Group Supplies Officer, 50, Holly-walk, Leamington Spa.

Complete X-ray Diagnostic apparatus. Pre-war Deans. Specially constructed and in excellent condition. Transformer 90/400. Wired for rotating anode. For sale.—Address, No. 156, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

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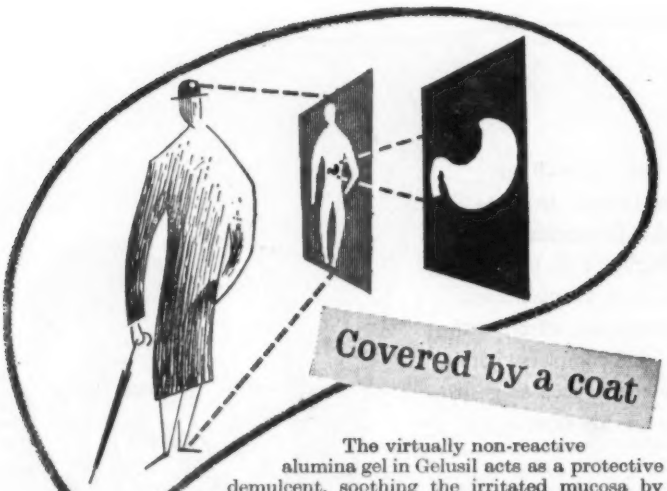

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